A CONCISE HISTORY OF THE COMMUNICATIONS-ELECTRONICS COMMAND AND FORT MONMOUTH, NEW JERSEY

FOREWORD

From the earliest days of our country's existence, the name Monmouth has been synonymous with the defense of freedom and liberty. Whether it is the early days of Camp Vail, our involvement in armed conflicts through the decades, or our present-day contributions to homeland security and Iraqi Freedom, the achievements of both Fort Monmouth and CECOM have empowered our country and transformed the ways in which it fights.

This concise history represents only a cursory highlight of what has gone on here during the past 90 or so years. Each and every day, we work not only to maintain the current readiness of our armed forces, but also seek new ideas and technologies designed to improve their capabilities. While the tools used to accomplish our mission today are radically different from those used in years past, the nature of our mission has changed very little from the days of bugles and carrier pigeons.

I encourage each and every one of you not only to read this brief history, but also take the opportunity to make your own positive contributions as well. If there is but one central underlying lesson to be gained from this book, it is that each member of this organization plays a critical role in equipping our forces and defending the ideals of our nation.

To those of you who have spent a great deal of time and effort in pursuit of these noble goals, I commend you; and to those who are just beginning their journey I extend to you my best wishes for your future success.

Sincerely,

William H. Russ
Major General, U.S. Army CECOM
Commanding

A CONCISE HISTORY OF FORT MONMOUTH, NEW JERSEY AND THE U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND

Courtesy of CTSC Visual Information Services.

Prepared by the Staff of the

OFFICE OF THE DEPUTY CHIEF OF STAFF
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U.S. ARMY COMMUNICATIONS-ELECTRONICS COMMAND
FORT MONMOUTH, NEW JERSEY

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CONTENTS

1
THE BEGINNING AND WORLD WAR I

The history of Fort Monmouth -- and its predecessor camps, Little Silver and Alfred Vail -- began in 1917 when the Army, at the outbreak of World War I, recognized that the Signal Corps with total manning of less than 2,000 officers and enlisted men was of insufficient size to provide needed communications support should the United States enter the war.

To meet this pressing need, the Army established four training camps for signal troops. Little Silver, New Jersey was one of them. The others were at Fort Leavenworth, Kansas; Leon Springs, Texas; and Presidio of Monterey, California. Government-owned land was utilized for all the camps except the one at Little Silver. Here the land was leased on a temporary basis, as authorized by the Adjutant General of the Army on 16 May 1917.[1]

The Little Silver site was located in an area rich in history dating back to the American Revolution. It was near here, in what is now the Township of Freehold, that the Battle of Monmouth Courthouse was fought. On 28 June 1778, General George Washington and troops of the Continental Army engaged the British forces led by Sir Henry Clinton. It was an all-day battle, with the British slipping away after dark and reaching the safety of the guns of the British fleet at Sandy Hook. Although inconclusive, the battle did show that the Continental troops, thanks to the training of the Baron Von Steuben, could now fight on equal terms with the British regulars in open battle.

Molly Pitcher at the Battle of Monmouth.

Through the years the Battle of Monmouth Courthouse has become famous as the last major engagement of the Revolution to be fought in the North. It is perhaps best remembered for the exploits of Molly Pitcher, the housewife who, while carrying water to the artillerymen, saw her husband fall wounded and took his place until help could arrive.

In later years, particularly those following the Civil War, Monmouth

County prospered. In 1870, the city of Long Branch, already a famous seaside resort, introduced horse racing to the area with the construction of Monmouth Park, a one-mile track. In relationship to today's post, the track was located partially in the southern part of the post, but primarily in what is today the Township of Oceanport. The track was an instant success and flourished for twenty years. Two steamboats made daily runs from New York to Sandy Hook where rail service connected to the track.

On 4 July 1890, a new Monmouth Park was opened. It featured a 1-1/2 mile track and a steel grandstand seating 10,000 people. The 640 acres of the new park encompassed all the area of Fort Monmouth today. The track itself was on the North side of today's Greely Field. The entrance was in the vicinity of the present east gate (Hartmann Gate) facing Oceanport Avenue.

Only three years after it opened, however, the New Jersey legislature banned horse racing in the state. One of the feature races, the "Jersey Derby," was moved to Louisville, Kentucky where it eventually became the famous "Kentucky Derby". Deserted, the steel grandstand and track were left to ruin and desolation.

Interest in the area was renewed, however, as World War I approached and the Army needed a site to establish a training camp. A portion of the 1890 Monmouth Park racetrack was leased by the Army from Melvin Van Keuren of Eatontown. Involved were 468 acres, an area bounded on the North by the Shrewsbury River, on the West and South by a stone road from Eatontown, and on the East by the Oceanport-Little Silver Road. Parker Creek, tributary of the Shrewsbury, traversed the entire property near the northern limits.

The land, leased with an option to buy, was subsequently purchased for $115,300.[2]

CAMP LITTLE SILVER

Lt. Col. Carl F. Hartmann who, as Chief Signal Officer of the Eastern Department at Governor's Island, New York, was directly involved in finding a site for the new training camp, became the first Commanding Officer of Camp Little Silver on 17 June 1917.[3] On the following day, the First and Second Reserve Telegraph Battalions arrived. By the end of the month, camp personnel totaled twenty-five officers and 451 enlisted men.

At this time, construction of the "old wooden camp" was in progress. A headquarters building, officers' quarters, barracks, transportation sheds, shops, and a warehouse near the railroad siding were being rushed to completion. Workers, both skilled and unskilled, were being paid big money for overtime work on Sundays and from daybreak to dark. With overtime pay, carpenters were making $30 per week.

Courtesy of Fort Monmouth Historical Museum.

Signal Corps Camp Little Silver, NJ (June 1917). Encampment immediately inside East Gate.

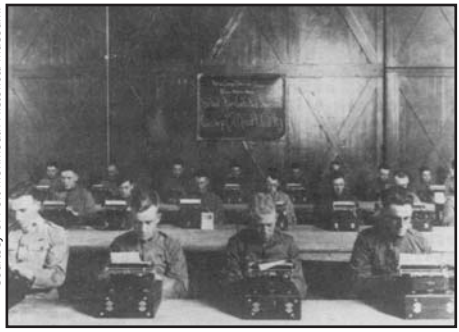
Major George E. Mitchell replaced Lt. Col Hartmann as Commanding Officer on 12 July 1917. Mitchell also commanded a Reserve Officers Training Battalion which was activated 20 July. This was the earliest of all training units at the camp.

Two tactical units were organized at the camp in July. They were the Tenth Field Signal Battalion and the Fifth Telegraph Battalion. The field battalion immediately began intensive training. Equipment was scarce, but instruction was considered to be as thorough as the situation could warrant.

CAMP ALFRED VAIL

On 15 September 1917, only three months after its establishment, the camp was placed on a semi-permanent basis and officially named Camp Alfred Vail.[4] Vail, an associate of Samuel F. B. Morse, inventor of the telegraph, was credited with devising the Morse alphabet of dots, dashes and spaces. It was felt that in view of his great contributions to wire communications it was proper that his name be commemorated in a Signal Corps Camp.

It was at this time that the Signal Corps, facing an urgent need for telegraph operators in France, initiated a six-week, intensive training course here, with emphasis on foreign codes and languages. Within a few weeks, 223 men had been gathered from throughout the Army for training and examination as German-speaking personnel. Additional groups of fifty or more arrived each month thereafter. The need for telegraph



Courtesy of Fort Monmouth Historical Museum.

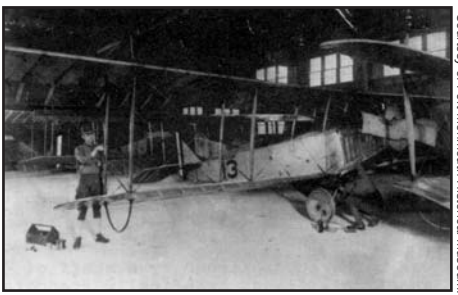
Camp Vail, NJ (1918). Blackboard reads: Non Com. Officers Class Army Paper Work. School for Inlisted Specialists, Camp Alfred Vail, NJ.

operators in France was so great that operators volunteering for overseas duty were given bonus payments.

The Eleventh Reserve Telegraph Battalion left Camp Vail on 18 October 1917 for embarkation at Hoboken. It was the first unit to leave the camp for the World War I battlefields. By the end of 1917, a total of 2,416 enlisted men and 448 officers were processed through the camp. Units that had been shipped overseas from here included the First and Tenth Field Service Battalions; Eleventh Reserve Telegraph Battalion; 52nd (1st Reserve), 55th (2nd Reserve), 408th (7th Reserve) Telegraph Battalions; and the 59th Aero Construction Squadron.

THE RADIO LABORATORY AND AERIAL TESTING

As an outgrowth of radio experimentation made necessary by particular demands of tank and aerial warfare, it was determined in late 1917 that a need existed for a special laboratory devoted exclusively to developmental work, and entirely independent of the commercial laboratories, where trained specialists could devote their entire energies to solving problems in wireless communication. The existing Electrical Development Division in Washington and the facilities in the Bureau of Standards were insufficient for experimentation, thus Camp Vail was selected as the site.



Courtesy of Fort Monmouth Historical Museum.

Camp Alfred Vail, NJ (Circa 1919). Radio Laboratory personnel installing radio equipment in Curtiss JN-4 (Jennys).

Concurrent with construction of the laboratory buildings, located in the area of what is now Barker Circle, work also began on four airplane hangars east of Oceanport Avenue. Draining and leveling of ground for two airfields also began. Aircraft were to be used in the testing of direction-finding by radio, as well as in development of radio communication and aerial photography.

The radio laboratory was charged with the development of radio equipment for the Army. Research initially centered on vacuum tubes and on circuits of existing equipment, the testing of apparatus submitted by manufacturers, and the application of new inventions. The work was being accomplished by a staff of 48 officers, 45 enlisted men and 12 civilians, principally stenographers.

Within a month, the radio equipment being produced required 90 to 95 airplane flights a week for testing, leading to the mistaken belief by area residents that the primary purpose of Camp Vail was as an airfield. The camp's flying activity reached its peak during this time, with personnel of the 122nd Aero Squadron operating a total of 20 aircraft: two DeHaviland 4's, nine Curtiss JN4-H's, six Curtiss 4-6HO's, and three Curtiss JN-4D's. This was the largest number of aircraft ever housed at Camp Vail.

On 28 June 1918, Colonel George W. Helms, Signal Corps, assumed command of the camp.[5]

INITIAL USE OF CARRIER PIGEONS

Carrier pigeons, used for communication by all the armies in World War I, and became a part of the Camp Vail training mission late in 1917.

Courtesy of Fort Monmouth Historical Museum.

Pigeons delivered over 95 percent of messages they carried, with some birds flying as fast as one mile per minute in combat conditions.

General John J. Pershing, Commander of the American Expeditionary Force, impressed by the use of pigeons by the British and French armies, had requested such a service be established in the American Army. Delayed on account of difficulty acquiring birds, the service – three officers, 118 enlisted men, and a few hundred pigeons – arrived in France in February 1918. 572 American birds served in the St. Mihiel offensive; 442 in the Meuse-Argonne offensive. During the Meuse-Argonne offensive, under murderous machine gun and artillery fire, one of these hero pigeons, “President Wilson,” flew twenty-five miles in as many minutes with a shattered leg and a badly wounded breast. Found dead in June 1929 at the age of eleven, he was stuffed, mounted, and

donated to the Smithsonian Institution. The last of the World War heroes, "Mocker," died at Monmouth in June 1937. With an eye destroyed by a shell fragment and his head a mass of clotted blood, on 12 September 1918, Mocker homed "in splendid time" from the vicinity of Beaumont, France with a message giving the exact location of certain enemy heavy artillery batteries. American artillery silenced the enemy guns, saving countless lives.

Their success in war led to the decision, after the Armistice, to perpetuate the service. To this end, Squier established the Signal Corps Pigeon Breeding and Training Section at Camp Alfred Vail. The officer in charge of the British pigeon service supplied 150 pairs of breeders; they arrived in Camp Vail, without loss, in October 1919. There they were kept, together with some of the retired "hero" pigeons of the World War, in one fixed and fourteen mobile lofts.[6]

ARMISTICE AND DEMOBILIZATION

With the signing of the Armistice on 11 November 1918, inductions and draft calls stopped and demobilization began for those units not needed to carry on essential work. All flying activities at the camp ceased and all aeronautical property was shipped to other locations. Energies of personnel at the Radio Laboratory were directed to completion of projects remaining on hand, and the laboratory decreased in relative importance for a time.

At the end of 1918, during the nineteen months of Camp Vail's existence, 129 semi-permanent structures had been erected; 47 of which pertained to the Radio Laboratory, including three hangars and a repair shop for airplanes. Two flying fields had also been constructed. All facilities were easily accessible by broad, hard-surfaced roads. Quartermaster facilities had been erected alongside the railroad spur. There were barracks to accommodate 2,795 enlisted men and 188 officers. There was a 40-bed hospital. Camp roads and a parade ground had been constructed, and some 200 tents erected along four company streets.

During 1918, units assigned at Camp Vail included three signal battalions, six telegraph and two depot battalions, two squadrons for air service, and two service companies. A total of 1,083 officers and 9,313 enlisted men served the post that year.

THE SIGNAL CORPS SCHOOL

The year 1919 was a time of demobilization and transition for the Signal Corps and Camp Vail.

The camp survived as an Army installation when the Chief Signal Officer, in a move to standardize signal communications throughout the Army and to consolidate Signal Corps installations, requested in August 1919 that the Adjutant General of the Army move all Signal Corps schools, both officer and enlisted, to Camp Vail.[7] This was quickly approved by the Secretary of War, and it was directed that the school be designated "The Signal Corps School, Camp Alfred Vail, New Jersey".

The first school commandant was Colonel George W. Helms, who had been serving as the fourth Commanding Officer of Camp Vail since June 1918. He served concurrently as commandant of the Signal Corps School and Camp Vail's Commanding Officer until December 1920.

Instruction in the new school began 2 October. The initial curriculum consisted of the officers' division, subdivided into radio engineering, telegraph engineering, telephone engineering, signal organization, and supply. The enlisted radio specialist course consisted of radio electricity, photography, meteorology, gas engine and motor vehicle operation. Electricity students were trained as telephone and telegraph electricians. There also were operator and clerical courses.

Since all aerial activity had ceased with the signing of the Armistice, the hangars were used by the school as workshops and classrooms. Such use was to continue well past World War II.

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POST WAR AND THE 1920 S

SIGNAL SCHOOL DEVELOPMENT

The Signal Corps School expanded during this period as demands grew for communications training. In June 1920, training of Reserve Officer Training Corps (ROTC) personnel developed into a major function of the school. The following year, training began for National Guard and Reserve officers.

During 1922, the Officers' Division reorganized its courses into two main sections: a Company Officers' Course for Signal Corps Officers and a Basic Course in signal subjects for officers of other arms and services and for newly commissioned Signal officers. Both sections were nine months in length.[8]

Designed primarily for the training of Signal Corps personnel, the school now found itself educating men from several branches of the Army. To eliminate confusion, the name of the school was officially changed in 1921 to reflect this expanded mission, becoming "The Signal School". (This title would be retained until 1935 when it would then again become "The Signal Corps School".)

In 1922-23, the school was regrouped into four departments. These were Communications Engineering, Applied Communications, a General Instruction course for all officers; and the Department for Enlisted Specialists.[9] The four hangars, which housed the aircraft of 1918 were now used as classrooms and workshops. Hangar I became the center for radio instruction. It was to be used for this purpose throughout the days of World War II.

Plans were made for meteorological instruction. This was scheduled to begin in 1919, but the necessity to repair equipment damaged in shipment from France delayed start of classes until 5 January 1920. Photographic instruction began in 1919; however, laboratory facilities did not become available until 1926. Instruction in motion picture production techniques was initiated in 1930. These courses, however, reverted to the Army War College in 1932.

A training literature section was formed in 1921. Its purpose was to

supply the technical and field manuals needed to instruct in operations and maintenance of Signal Corps equipment. The section remained as one of the major departments of the school until 1941 when its duties were taken over by the Signal Corps Publications Agency.

THE CAMP BECOMES A FORT

In 1925, Camp Vail was to lose its identity of the past eight years and be designated a permanent post in the military establishment. Office Memorandum Number 64, Office of the Chief Signal Officer, dated 6 August 1925 stated, "The station now known as Camp Alfred Vail, New Jersey, is being announced in War Department General orders as a permanent military post and will hereafter be designated as 'Fort Monmouth', New Jersey. Mail to that post will be addressed to Fort Monmouth, Oceanport, New Jersey."

The post was named in honor of the men of the Revolution who fought and died on the fields of Monmouth.

THE LABORATORY--LEAN YEARS TO CONSOLIDATION

Although overshadowed by the Signal School, the Radio Laboratory remained one of the most important facilities at Fort Monmouth. The Signal Corps had quickly concluded after World War I that it was of utmost importance that adequate research facilities be maintained for the design and development of Army communications equipment, even if at a reduced scale because of budget restrictions.

Courtesy of Fort Monmouth Historical Museum.

Camp Vail (1924).

Research continued, although on a reduced scale, and maximum use was made of the meager budget. The SCR-136, a ground telephone and telegraph set for artillery fire control up to 30 miles, was developed in 1926. Along with the SCR-134, mounted in observation aircraft, it would also furnish air-ground liaison. Other projects included the SCR-131, a light and portable unit designed for infantry division and battalion telegraph, with a five-mile range to limit possible enemy interception; the SCR-161 for artillery nets; the SCR-162 for contact

between coast artillery boats and shore control points; and the SCR-132, a 100-mile telephone transmitter with an 80-foot portable, collapsible mast. Experimentation was also underway on such items as tube testers, crystal controller oscillators, unidirectional receivers, and non-radiating phantom antennas.

In 1929 the first radio-equipped weather balloon was launched at Fort Monmouth. This was the first major development in the application of electronics to the study of weather, and of conditions in the upper atmosphere.[10]

Prior to 1929 the function of the laboratory had been primarily to design and test radio sets and some field wire equipment. Plans were formulated that year, however, to consolidate the wide-spread laboratory facilities of the Signal Corps, then in five separate locations.

In the interest of "economy and efficiency" the Signal Corps Electrical Laboratory, the Signal Corps Meteorological Laboratory, and the Signal Corps Laboratory at the Bureau of Standards, all in Washington, D.C., were moved to Fort Monmouth. All were consolidated as the new "Signal Corps Laboratories".[11]

In 1930, the Subaqueous (underwater) Sound Ranging Laboratory transferred here from Fort H. G. Wright, New York. The Signal Corps Aircraft Radio Laboratory at Wright Field, Dayton, Ohio had been considered for consolidation, but subsequently deleted. It and the Photographic Laboratory at Fort Humphreys were the only research organizations not located at Fort Monmouth. For the first time the personnel and facilities to handle almost any Signal Corps problem were available in one location.

As of 30 June 1930, the Signal Corps Laboratories had a personnel strength of five commissioned officers, twelve enlisted men, and fifty-three civilians.[12]

ENHANCED USE OF CARRIER PIGEONS

The pigeon training section, established at Fort Monmouth (Camp Vail) in 1917, continued its activities with new techniques being worked out for training of the birds, particularly for two-way and night flying. Breeding strains were also being improved.

In 1925, the section had a breeding base with 75 pairs of breeders, two flying lofts with 100 birds for training and maneuvers, and one stationary loft with thirty long-distance flyers. Available facilities permitted the breeding of a maximum of 300 birds per season. That number was banded and held available to fill requisitions from the eighteen lofts scattered throughout the United States and its possessions. The birds were being used for instruction, then, in Signal School maneuvers and ROTC courses where the Officers' Division featured twelve hours of pigeon instruction.

In 1928, Fort Monmouth's pigeon handlers successfully began breeding and training birds that would be willing to fly under cover of darkness. By the outset of World War II, they had also perfected techniques for training two-way pigeons. In the first test, May 1941, twenty birds completed the round trip from Fort Monmouth to Freehold (about fourteen miles away) in half an hour.

Courtesy of Fort Monmouth Historical Museum.

Pigeon with message attached to it's leg.

At that time, the Pigeon Center at Fort Monmouth had an emergency breeding capacity of 1,000 birds a month. This represented about one fourth of the Army's maximum anticipated requirements. However, of the 54,000 birds the Signal Corps furnished to the Armed Services during World War II, American pigeon fanciers supplied 40,000 by "voluntary donation."

In October 1943, the Pigeon Breeding and Training Center relocated to Camp Crowder, Missouri. However, on 20 June 1946, the Center returned to Fort Monmouth, along with the long-lived "Kaiser" and more than two dozen heroes and heroines of World War II, including "G.I. Joe," "Yank," "Julius Caesar," "Pro Patria," and "Scoop."

Fort Monmouth pigeons served also in Korea, where they proved particularly useful to covert operatives in enemy-controlled territory. By then, however, the "hand-writing was on the wall." Field Manual 100-11, "Signal Communications Doctrine" (22 July 1948) stated: "The widespread use of radio in conjunction with the airplane to contact and supply isolated parties has rendered the use of pigeon communication nearly obsolete."

Department of the Army discontinued its pigeon service in 1957. In March that year, having donated the fifteen living "hero" pigeons to zoos in various parts of the country, Fort Monmouth sold the remaining birds – about a thousand of them – for $5 per pair.

SIGNAL CORPS BOARD

Among the many accomplishments of Camp Vail/Fort Monmouth was the establishment here in June 1924 of the Signal Corps Board. This followed a suggestion to the Chief Signal Officer by Lt. Col. John E. Hemphill, the fifth Commanding Officer of Camp Vail. Hemphill wrote:

> ". . . the need for a board of Signal Corps officers to be continuously assembled at a center of Signal Corps activities for the consideration of problems of organization, equipment and tactical and technical procedure has long been recognized. Preferably such a board should consist of officers of considerable rank and length of service in the Signal Corps who would be competent to pass on such equations and would also be able to devote their entire time to the duties of such a board. Due to the shortage of personnel it does not appear that it will be practicable to detail such a board in the near future. The best present arrangement would seem to be a board at Camp Vail consisting of the officers at this post who are immediately connected with the administration and supervision of matters relating to general Signal Corps training. Detailed studies, experimental work, or field tests could be delegated from time to time by this board, with the approval of the Commanding Officer, to the proper subordinates at Camp Vail. It is therefore recommended that a permanent Signal Corps Board be constituted at Camp Alfred Vail to act on such matters as may be referred to it by the Chief Signal Officer."[13]

Army Regulation 105-10 directed the establishment of such a board, 2 June 1924. Over the years, typical cases considered by the board were the Tables of Organization, Allowances and Equipment, Efficiency Reports, Signal Corps Organizations, Signal Corps transportation needs, etc.

POST ORGANIZATIONS

The 15th Signal Service Company, acting as the parent organization for all new recruits as well as for camp and school details, had the longest record of any unit permanently assigned at the Fort. It had been activated as Company B, Signal Corps at Camp Wikoff, New York on 27 July 1898. It came to Camp Vail on 4 March 1919. Students at the Signal School were attached to the unit for rations, quarters and administration. Periodically existing as a company, battalion and regiment, the 15th maintained its identity until late in World War II.

Courtesy of Fort Monmouth Historical Museum.

East Gate.

Two other long-term organizations at Fort Monmouth were the 51st Signal Battalion and the 1st Signal Company. Battalion personnel were occupied with garrison duties or replacement training, devoting the main training effort to technical subjects: radio and telegraph operation, electricity, maintenance, line construction, and meteorology.

The 1st Signal Company, a permanently assigned detached unit of the 1st Division at Fort Devins, Massachusetts, carried out training required of divisional troops and participated to a limited extent in garrison details. Some instructors were furnished to the Signal School.

The Army, increasingly conscious of the possibilities of mechanized warfare, conducted extensive maneuvers from July-October 1928 in Maryland. The 1st Signal Company conducted experiments with motorized equipment during the exercise. From a signal standpoint, the principal conclusions were that radio was a prime means of communications for armored, mobile forces; that wire was useful only in rear areas; and that pigeons were impractical since they could not be trained to home to a moving loft.

The company continued in its prescribed role as a division communications unit, reportedly in a highly satisfactory state of training and morale and with equipment maintained in excellent condition.

In 1925, the Signal Corps, in collaboration with the American Radio

Relay League, organized the Army Amateur Radio Service (AARS). Hundreds of HAM radio operators were grouped together in Corps Area Nets, each of which had several sectional radio nets, all coordinated by the control station located at Fort Monmouth. AARS had two objectives –the first to provide a world-wide radio communications capability for emergency use, the second, to provide a ready reserve of skilled radio operators that could be called into service in the event of another war. In 1948, AARS became a joint program with the Air Force and was renamed the Military Amateur Radio Service (MARS). The system proved its value in subsequent decades in disaster relief efforts, as well as relaying messages between servicemen abroad and families at home.

PERMANENT CONSTRUCTION BEGINS

Colonel James B. Allison succeeded Lt. Col. John E. Hemphill in August 1925 as the sixth Commanding Officer of Fort Monmouth. He served only one year in the assignment, but during this time, did initiate plans for construction of permanent barracks and a hospital building.

Actual construction did not begin until 1927 during the command tenure of Colonel George E. Kumpe, who had succeeded Colonel Allison in August 1926.

Built of red brick, four barracks, housing approximately 200 men each, were completed in August 1927 around what is now known as Barker Circle. The hospital wing was completed in 1928.[14] An additional wing was completed in 1934. The building, number 209, known as Allison Hall, formerly housed the Satellite Communications Agency and today is part of the Patterson Army Health Clinic.

In the second and third increments of permanent construction, quarters were completed and accepted on 15 August 1928 for field officers, company officers and NCOs. The following year, on 6 August 1929, five four-family apartment houses and one BOQ were completed and accepted.[15] The remaining permanent construction would be completed in the 1930's.

Colonel Arthur S. Cowan succeeded Colonel Kumpe as the eighth Commanding Officer in September 1929. Colonel Cowan had served previously as post commander in 1917-18 and now was to serve the longest time of any commander, September 1929 to April 1937.

Courtesy of Fort Monmouth Historical Museum.

Lieutenant Colonel
John E. Hemphill
Commanding Officer
Fort Monmouth
1924-1925

Courtesy of Fort Monmouth Historical Museum.

Colonel
James B. Allison
Commanding Officer
Fort Monmouth
1925-1926

Courtesy of Fort Monmouth Historical Museum.

Colonel
George E. Kumpe
Commanding Officer
Fort Monmouth
1926-1929

Courtesy of Fort Monmouth Historical Museum.

Colonel
Arthur S. Cowen
Commanding Officer
Fort Monmouth
1929-1937

3
PEACETIME TRAINING--1930 S

POST UNITS--MANEUVERS AND MARCHES

Courtesy of Fort Monmouth Historical Museum.

Fort Monmouth (January 1933). Construction underway on Field Grade and SNCO Quarters. Note the remnants of racetrack.

With the outbreak of war in Europe in 1939, the two tactical units at Fort Monmouth -- the 51st Signal Battalion and the 1st Signal Company--were well trained and equipped for field service. For the past decade, the units had been demonstrating that the Signal Corps was admirably prepared for the most stringent demands of mechanized warfare.[16] The 51st Signal Battalion had been reorganized in 1933 to better prepare it for field training on a large scale. Its new missions were to provide enlisted instructors and overhead for the Signal Corps School; organize a provisional radio intelligence detachment; and form the nucleus of a General Headquarters (GHQ) signal service, including a meteorological, photographic, and radio intelligence company.

The tactical units of the Signal Corps were kept in the field much of each summer during the 1930's by a series of maneuvers. In 1934, General Douglas McArthur, Army Chief of Staff, conducted a GHQ Command Post Exercise centered in the Fort Monmouth -- Camp Dix -- Raritan Arsenal triangle. The 51st Signal Battalion, with the 1st Signal Company attached, provided signal services for the exercise, manning message centers, handling radio intelligence, and performing radio, wire, and meteorological functions.

In 1935, the 51st Signal Battalion installed all communications for the most extensive Army maneuvers held since World War I. The unit installed the Army corps and umpire nets in the Pine Camp area of New York, using 177 miles of bare copper wire, 126 miles of twisted pair field

wire, and 8,260 feet of lead-covered, multiple pair overhead cable.

In the summer of 1937, the 1st Signal Company journeyed to Camp Ripley, Minnesota to install, operate and maintain signal communications for a phase of Fourth Army maneuvers.

Also in 1937, the 51st Signal Battalion was assigned to maneuvers of newly "streamlined" combat divisions in the area near Fort Sam Houston, Texas. As part of its participation, the 51st engaged in a road march from Fort Monmouth to San Antonio, Texas -- the longest motor convoy trip of its size in the Army's history. War conditions were simulated as closely as possible. The thirteen officers and 350 enlisted men, along with 55 vehicles, departed Fort Monmouth on 21 July 1937 and arrived at their destination on 2 August.

The following year, the 51st journeyed to Biloxi, Mississippi for maneuvers and took part in the Fort Bragg-Air Corps Anti-Aircraft Exercises. The 1st Signal Company worked with the Army War College command post exercise at Washington.

SIGNAL CORPS SCHOOL

In 1935, the Signal Corps School, which in 1921 had been changed to the Signal School to reflect its mission at that time, reverted to its original name as part of a reorganization.

During the depression years, the Signal Corps experienced an acute shortage of trained personnel, particularly instructors. This resulted in the offering of advanced courses for selected students in order to qualify them for the more responsible positions in the Signal Corps. The courses included Tactics and Techniques in Signal Communications, Auxiliary Signal Services in the Theater of Operations, Signal Operating Instructions and Orders, Equipment Studies, Staff Relations, Training Management, War Plans, Expeditionary Forces, Signal Supply, Duties of Corps Area Signal Officers, Historical Studies, and Field Exercises.

As a part of its reorganization, the Departments of Communications Engineering and Applied Communications were combined into the Officers' Department.

The Enlisted Department adopted new techniques in teaching, turning to individual instruction instead of the classroom method. Courses in the

Enlisted Department were subdivided in the following year, becoming more highly specialized. They remained basically the same from then until World War II.

As World War II approached, the Signal Corps School functioned with three distinct divisions: The Officers' Department, Enlisted Department, and the Department of Training Literature. The faculty was comprised of 78 persons, eleven of them were officers.

During the two decades since World War I, 4,618 enlisted men graduated from the school. Of these, 2,486 were Signal Corps personnel, with the remainder representing sixteen other branches or services, as well as foreign nations.[17]

CORPS LABORATORIES AND RADAR

The newly named "Signal Corps Laboratories" consolidated here in 1929, received a new director in 1930. Major William R. Blair, distinguished in scientific and military fields, was appointed. He served in this position until illness forced his retirement in 1938.[18]

Until 1935, there were no physical changes at the laboratories. They were crowded into nine wooden buildings constructed in 1918. In 1934, however, as a result of constant pressure by Major Blair, a $220,000 appropriation was received for construction of a permanent, fireproof laboratory building and shops. This structure, built under contract, was scheduled for completion 11 November 1934, but not actually completed and accepted until 1 March 1935. It was named Squier Laboratory in honor of Major General George O. Squier, the Army's Chief Signal Officer from 1917-1923.

Much of the communications equipment used by American forces during World War II was designed and developed here during the 1930's. The laboratories completed six field radio sets; readied several artillery pack sets for tests, and fielded the SCR-197, a new Air Corps mobile transmitter. The SCR-300, the "Walkie-Talkie" radio set, was perhaps the best-known development of the period. In addition, switchboards, field wire, and radio receivers were developed.

Certainly one of the most important pieces of equipment developed during this time was RADAR (Radio Detection and Ranging). The term, RADAR, was first coined by the Navy in 1941 and agreed to by the

Army in 1942. The definition given in the first Signal Corps Field Manual on Aircraft Warning Service stated, "RADAR is a term used to designate radio sets SCR (Signal Corps Radio)-268 and SCR-270 and similar equipment".[19] The facts were that the SCR-268 and 270 were not radios at all, but for top security reasons were designated as such.

Although important offensive applications have since been developed, radar emerged historically from the defensive need to counter the possibility of massive aerial bombardment. Sound detectors suffered from inherent limitations. Attempts to use electromagnetic waves during World War I gave interesting experimental results, but no operational equipment was produced.

In the 1920s, numerous tests were made with heat emitted from airplane motors or reflected by airplane surfaces. From 1926 to 1930, the Army Ordnance Corps did this work. The project was transferred to the Signal Corps in 1930; however, due to a misunderstanding, the research was duplicated by the Army Corps of Engineers for several years. In 1936, however, all Army detection development was officially assigned to the Signal Corps.

In 1936, very active development was instituted on radio detection. The radio interference or "beat" method gave strong indications from passing planes but lacked directivity. Efforts were shifted to the radio pulse-echo method, and by its means, planes were successfully detected on an oscilloscope before the end of 1936.

In May 1937, a combined system of heat and radio pulse-echo detection against aircraft was successfully demonstrated before the Secretary of War. Shortly thereafter, substantial funds were made available for the first time, and the Signal Corps embarked on definite projects for development of a searchlight control and gunlaying detector, a surface vessel detector, and a long-range aircraft detector.[20] Between 30 June 1930 and 30 June 1935, the average personnel strength of the laboratories was 12 officers, 36 enlisted men, and 119 civilians. Civilian personnel strength continued to grow slowly through 1940 with 234 assigned as of 30 June. Officer and enlisted strength had dropped slightly to 8 officers and 15 enlisted. Within the following year, however, the strength was to increase dramatically and as of 30 June 1941, civilian manning was 1,227. There were 28 officers, with an additional 29 officers from the Coast Artillery Corps and seven officers from the Armored force.

COMPLETION OF PRE-WORLD WAR II CONSTRUCTION

The post's permanent red brick construction, which had undergone its first phase during 1927-29, entered its second phase in 1930 when construction began on three four-family apartments, one Bachelor Officer's Quarters, six double sets of quarters for Noncommissioned Officers, and one set of quarters for field officers. These projects were completed in October 1931. They were followed in June 1932 by completion of eight double sets of Company Officers' Quarters, seven double sets of NCO Quarters, and one four-family apartment complex.[21]

Courtesy of Fort Monmouth Historical Museum.

Fort Monmouth (October 1936). Second phase of permenant construction including Kaplan Hall, Russel Hall and CG's Quarters. At the time, Post did not extend south of Oceanport Creek.

Construction of a post theater, financed by Army Motion Picture funds, was authorized by the Army's Adjutant General.[22] The 574-seat theater opened 15 December 1933 with a showing of "Dr. Bull", starring Will Rogers. The theater, Building 275, was called the War Department Theater Number 1.[23] Twenty years later, in December 1953, the building was officially dedicated as Kaplan Hall in memory of Major Benjamin Kaplan, an engineer who served in both military and civilian positions at Fort Monmouth for 25 years and was associated closely with the permanent construction program of the 1920's and 30's. (Kaplan Hall is today the home of the Communications-Electronics Museum.) [24]

The final phase of the pre-war permanent construction program was completed between 1934 and 1936 under the Works Projects Administration (WPA). In 1934, eleven double sets of NCO Quarters were completed, along with the West Wing and an addition to the North end of the Hospital (Building 209).[25] A blacksmith shop, incinerator, bakery, warehouses, band barracks and utility shops were also completed in 1934.[26] The following year saw the completion of the fire station guardhouse Signal Corps Laboratory (Squier Hall), three sets of quarters for field officers and three sets for company grade officers.

The last quarters to be completed were those of the Commanding

Officer (Building 230). Colonel Arthur S. Cowan, then the 8th Commanding Officer, was the first to occupy the quarters. The last of the permanent pre-war construction was the headquarters building, known as Russel Hall. It was completed in 1936.[27]

FT. MONMOUTH SIGNAL CORPS PUBLICATIONS AGENCY

The growing need for printed training, operational and maintenance materials gave rise to a Signal School "training literature section" whose mission was to write and publish training manuals, regulations, school texts, and other technical materials. The Joint Congressional Committee on Printing authorized a print plant for the school in 1927. Over the next 15 years, this requirement evolved into the Fort Monmouth Signal Corps Publications Agency, activated in November 1943. This agency, organized and operated by the Ft. Monmouth Training Center consisted of the School's Department of Training Literature, the Instruction Literature Section of the Ft. Monmouth Signal Laboratories, and the Technical Publications Section of the Evans signal Laboratories. By 15 January 1944, this organization, which occupied sixteen buildings on Main Post, had five hundred products pending.

389th ARMY BAND

The 389th Army Band, which traces its history back to 1901 when it was organized at Fort Meade, Maryland as the 13th Cavalry Band, came to Fort Monmouth in August 1930 as the Signal Corps Band. In 1944, it was designated the 389th Army Band, the name it bears today. It is the official band of the Army Materiel Command (AMC) and, in that capacity, serves all of AMC's subordinate commands when musical support is required for military and official functions. It also supports Army recruiting and participates regularly in community events.

Courtesy of Fort Monmouth Historical Museum.

Fort Monmouth Band, Circa 1930.

4
THE BUILD UP AND TRAINING

LIMITED EMERGENCY

On 8 September 1939, following the outbreak of war in Europe, President Roosevelt proclaimed a state of "limited emergency". This action was to have an immediate impact on Fort Monmouth.

The Army was immediately authorized additional personnel, increasing from 210,000 to 227,000 officers and men. This rapid expansion directly affected the Signal Corps School here as it changed to expanded wartime training. Changes were made in the school curriculum, both officer and enlisted courses, to accommodate the increased enrollment. The Commandant, Colonel Dawson Olmstead, was advised the school would probably be called upon to train 224 officers and 2,455 enlisted men to fill vacancies in newly organized units. Also 75 officers and 1,300 men would be required annually as replacement. The estimates were extremely conservative, as events would soon prove.

One year following the "limited emergency" proclamation, Congress passed the Selective Training and Service Act providing for one year compulsory military training. The President simultaneously called the National Guard into Federal service, and the Army increased in size to 1,400,000.

Colonel Olmstead was promoted to Brigadier General on October 1940, thus becoming the first General Officer to serve as post commander.[28]

SIGNAL CORPS REPLACEMENT CENTER

With the passage of the Selective Service Act, General Olmstead was advised by the Chief Signal Officer to develop a Replacement Training Center at Fort Monmouth where enlisted personnel would receive one year of training. The Signal Corps Replacement Center opened in January 1941. Capacity was fixed at 5,000 men. By December, however, it was necessary to increase the capacity to 7,000 and to reduce the one-year training period to 13 weeks.

The first Commanding Officer of the Replacement Center was Colonel George L. Van Deusen. He assumed command 14 January 1941.[29]

In April 1941, Colonel Van Deusen was promoted to Brigadier General. He retained his post as Commandant of the Replacement Center until November 1941. By August 1941, he wore two additional hats: that of Signal Corps School Commandant (July 1941 - November 1942), and the eleventh Commanding Officer of Fort Monmouth (August 1941 - September 1942).

Courtesy of Fort Monmouth Historical Museum.

Colonel George L. Van Deusen, Commanding Officer, Signal Corps Replacement Center.

In view of the increasing expansion of Fort Monmouth, General Van Deusen initiated the purchase of additional land. The area, now the Charles Wood area, was considered ideal for replacement training activities for as many as 7,000 men. Adequate space was available for all necessary buildings and a maneuver area.[30]

At Camp Charles Wood, as it was called in 1942, construction was completed within 90 days on 60 barracks, eight mess halls, 19 school buildings, 10 administration buildings, a recreation hall, post exchange, infirmary, and chapel. The camp was officially dedicated 14 July 1942.[31]

Along with the purchase of the Camp Charles Wood Area, negotiations were also well underway for leasing the New Jersey State National Guard Encampment at Sea Girt. By April 1942, the 1st Signal Training Battalion moved from the main post to the new camp at Sea Girt, now designated Camp Edison in honor of Charles Edison, the governor of New Jersey and son of the famed inventor.

By mid-1942, the Replacement Training Center was in operation at the three locations: Fort Monmouth, Camp Charles Wood, and Camp Edison. Also at this time, two noncontiguous field training areas were acquired near the communities of Allaire and Hamilton. These wooded tracts were used extensively in field bivouac and maneuver problems.

By the spring of 1943, the recruit underwent a program that began with three weeks of basic training at Camp Edison, four days of field operations at Allaire or Hamilton, and culminated in an overnight march to Camp Wood for final specialist training.

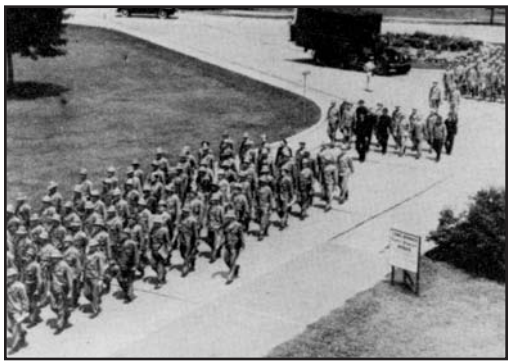
The unit-training center was finally deactivated in November 1943.

During the 30 months of its existence, the center produced more than 60,000 Signal Corps specialists. The enlisted cadre peak was 1,157 with 250 officers and civilians also assigned.[32]

THE OFFICER CANDIDATES

The other major element in wartime training at Fort Monmouth was that for officer candidates. The Officer Candidate Department was activated within the Signal Corps School on 2 June 1941. The first class commenced on 3 July 1941. The first class, with an input of 490, graduated 335 newly commissioned second lieutenants after three month's training. Subsequent classes averaged about 250 men, but gradually grew to 1,000 men per class.

On 20 June 1942, the Signal Corps School was redesignated as the Eastern Signal Corps School (ESCS). As such, its department for officer candidate training was renamed Officer Candidate School (OCS). Field exercises were added to the training, allowing the candidates to gain practical experience that might otherwise be lacking. A 16-hour exercise simulating signal company support of an infantry division was initiated, and offered training in message center and messenger procedures, wire construction, and radio and wire communication. Command posts were established for the forward and rear echelons of a division headquarters and three combat teams. The officer candidates moved from one to another, alternating duties among the four phases of communications.



Courtesy of Fort Monmouth Historical Museum.

Eastern Signal Corps Training Center, Fort Monmouth, NJ (1942). Officer Candidates marching from barracks to classroom.

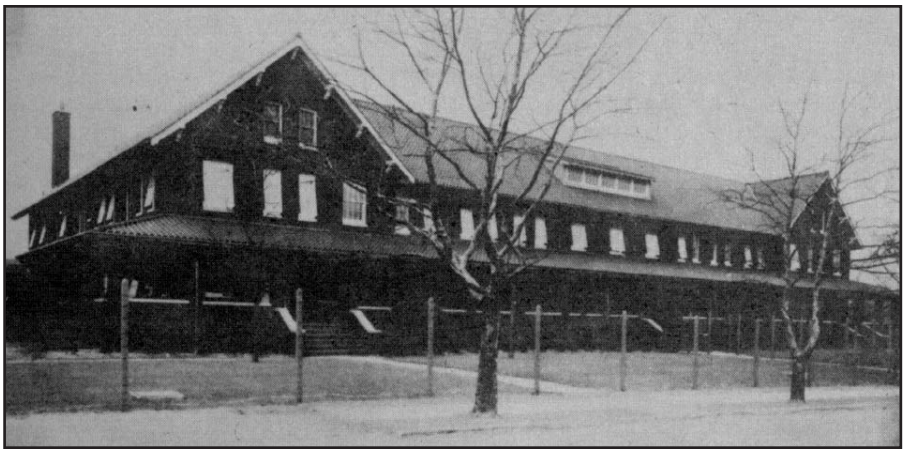
In October 1942, all training functions at Fort Monmouth were consolidated into the Eastern Signal Corps Training Center (ESCTC).[33] Within a few months, the Officer Candidate School was extended from three months to four. This provided one month of field work in addition to the academic instruction. In December 1943, 36 officers of the Women's Army Corps, enrolled in the School's message center course, becoming the first women to be accepted for training at Fort

Monmouth. More than 21,000 officers completed the Officer Candidate Course during its Fort Monmouth tenure.

WARTIME LABORATORIES

During 1940 and 1941, three field laboratories were established.[34] Field Laboratory Number One, later to be designated the Camp Coles Signal Laboratory, was located at Newman Springs and Half Mile Roads West of Red Bank, New Jersey, where 46.22 acres of land were being used for observing and measuring pilot balloon ascensions. Right-of-way for the land was obtained in April 1941, with subsequent purchase by the government in June 1942 for $18,400.[35] The Chief Signal Officer earmarked more than $700,000 for building construction at the site.

Field Laboratory Number Two, (later the Eatontown Signal Laboratory) needed an experimental area on which to construct antenna shelters. To meet this need, the laboratory was assigned 26.5 acres of a 200-acre tract west of Eatontown, which had been leased as part of the expansion of training activities (part of Charles Wood Area).[36]



Courtesy of Fort Monmouth Historical Museum.

Administration Building of Camp Evans Signal Laboratory, Belmar, NJ (April 1943). Signal Corps grounds radar development activities were moved here from Fort Hancock Field Laboratory in 1942. The building itself was completed and dedicated by the Marconi Wireless Telegraph Company in 1914. It was originally built for a 45-room hotel for unmarried employees of that company.

Field Laboratory Number Three had its origin in the Radio Position Finding section of the Signal Corps Laboratories and was located temporarily at Fort Hancock, New Jersey. It later was to become the Evans Signal Laboratory and located south of Fort Monmouth on land

which the Army purchased beginning in November 1941. Included in the purchase were land and buildings originally owned and developed by the Marconi Wireless Telegraph Company of America. A three-story brick building, dedicated in 1914 as the Marconi Hotel to house the firm's unmarried employees, was used as the main administration building of the Evans Signal Laboratory. Two one-story brick cottages, also constructed by the Marconi Company and located directly across the street from the hotel, were used as quarters for military officers.

A number of brick buildings were constructed at the Evans Signal Laboratory in 1941-1942. The first to be completed were four long, rectangular, one-story buildings connected by enclosed wooden walkways to comprise a large laboratory complex. Two brick boiler houses with oil-fired boilers were also constructed.

Also constructed in 1941-1942 was a group of three research and development laboratories with an office; two smaller laboratories, each with a separate boiler house, another laboratory and boiler house; and a shop facility. All were one-story brick structures designed to house a research center for the Signal Corps radar program.

Courtesy of Fort Monmouth Historical Museum.

Aerial photo of Fort Monmouth, NJ (1943). Middle left of photo one can see BOQ quarters adjacent to Parker's Creek and North of Field Grade and CG's Quarters.

A large number of wood buildings were also constructed at the Evans Laboratory site during World War II. Included were two groups of radio antenna shelters. Designed to house radar units, these were tall, one-story structures with exterior wood post buttresses. Although most of these structures have been altered to accommodate other functions, several remained virtually intact for a number of years.

The wartime laboratories quickly reached a peak. A total of 14,518 military and civilian personnel were assigned as of December 1942. Field Lab Number One at Camp Coles, Field Lab Number Two at

Eatontown, and Squier Lab on post were organized into the Signal Corps General Development Laboratories (SCGDL). Field Lab Number Three at Fort Hancock became the Signal Corps Radar Labs, and subsequently moved to Camp Evans with a redesignation as the Camp Evans Signal Lab in March 1942. In April 1945, this was shortened to Evans Signal Lab.

In 1941 the laboratories at Fort Monmouth developed the SCR-510. This was the first FM backpack radio. This development was an early pioneer in frequency modulation circuits, providing front line troops with reliable, static free communications. They also fielded multichannel FM radio relay sets (e.g., AN/TRC-1) in the ETO as early as 1943. FM radio relay and RADAR – both products of the Labs at Fort Monmouth, are typically rated among the four of five "weapon systems" that made a difference in World War II.[37]

In December 1942, the War Department directed the Signal Corps General Development Laboratories and the Camp Evans Signal Lab to combine into the Signal Corps Ground Service (SCGS) with headquarters at Bradley Beach, New Jersey (Hotel Grossman).

In December 1942, the laboratories had personnel strength of 14,518 military and civilian personnel. The Signal Corps Ground Service was directed by the War Department, however, to cut the total military and civilian personnel to 8,879 by August 1943.[38] In June 1944, "Signees", former Italian prisoners of war, arrived at Fort Monmouth to perform housekeeping duties. A Lieutenant Colonel and 500 enlisted men became hospital, mess, and repair shop attendants, relieving American soldiers from these duties.

INVENTIONS OF THE LATE 1940S

In 1948 the first Weather Radar was developed at Fort Monmouth and observed, for the first time, a rainstorm that was at a distance of 185 miles and was able to track the storm as it passed over the Fort.[39]

Also in 1948 researchers at Fort Monmouth grew the first synthetically produced large quartz crystals. The crystals were able to be used in the manufacture of electronic components, and made the U.S. largely independent of foreign imports for this critical mineral.[40]

In 1949 the first auto-assembly of printed circuits was invented. A tech-

nique for assembling electronic parts on a printed circuit board, developed by Fort Monmouth engineers, pioneered the development and fabrication of miniature circuits for both military and civilian use. Although they did not invent the transistor, Fort Monmouth scientists were among the first to recognize its importance, particularly in military applications, and did pioneer significant improvements in its composition and production.[41]

END OF THE WAR

Wartime training started to wind down early. Reductions began in May 1943 with orders to inactivate the Replacement Training Center. This was later partially revoked. The capacity of the Officer Candidate School was set at 150 in August 1943. Classes entered at 17-week intervals. Enrollments fluctuated thereafter.

On 3 January 1945, Brigadier General Stephen H. Sherrill became Commanding Officer of the Eastern Signal Corps Training Center. He served only until the end of that year when he was succeeded by Brigadier General Jerry V. Matejka.

With the decline in requirements for trained replacements within the Signal Corps, most of the functions of the Enlisted Department of the Signal School were transferred to Camp Crowder, Missouri.

The Eatontown Signal Laboratory was transferred from the authority of the Chief Signal Officer to that of the Commanding General, Army Air Forces, on 1 February 1945. It was renamed Watson Laboratories and, in 1951, was moved to Rome, New York.

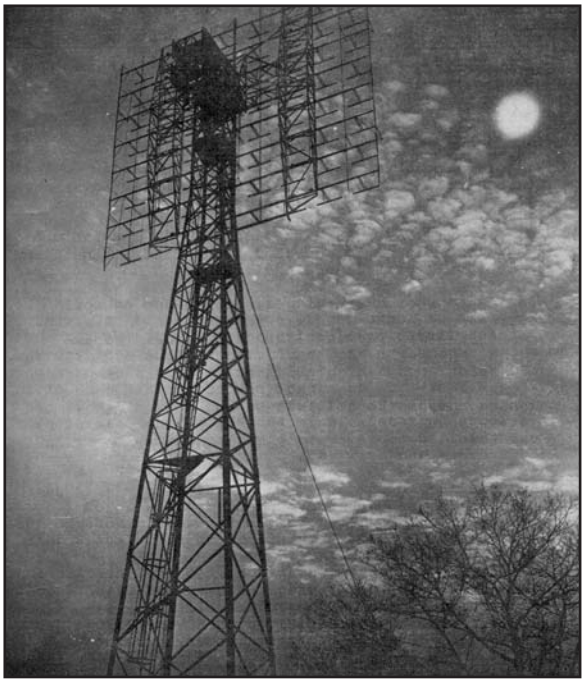
With the end of the war in Europe on 8 May 1945, a Redeployment Branch was established as a separate function of the Unit Training Center and a redeployment program carefully worked out to retrain personnel before deployment to the Pacific. However, with the war against Japan ending shortly thereafter, the redeployment initiatives were changed to meet the challenge of speeding Army discharges in the New York, New Jersey and Delaware areas. A Separation Center was established here in September 1945, and separated more than a thousand men from the Army every day until 31 January 1946.

Also with the end of the war, Camps Edison and Wood were deactivated and almost abandoned. The Eastern Signal Corps Training Center was

deactivated in April 1946, and Brigadier General Jerry V. Matejka, the center commander since the end of 1945, became the fourteenth commander of Fort Monmouth. He succeeded Colonel Leon E. Ryder who had served in the assignment since November 1944.[42]

PROJECT DIANA

Research in radar technology continued at the Evans Signal Laboratory at the end of World War II. A milestone in scientific history was witnessed at the Belmar site on 10 January 1946. Signal Corps scientists, under the direction of Lt. Col. John J. DeWitt, using a specially designed radar antenna (called the Diana Tower) succeeded in reflecting electronic signals off the moon. A beam of high frequency energy, traveling at the speed of light (186,000 miles per second), was directed at the moon and 2.5 seconds later was recorded on the radar screen. Continuous recordings were made at regular 2.5 second intervals.[43]



Courtesy of Fort Monmouth Historical Museum.

Project Diana.
Army contacts the Moon for the first time (1946).

5
KOREA AND THE 1950'S

Although overall military strength dropped rapidly following the end of World War II, the need for trained signal personnel continued throughout the post-war period and Fort Monmouth remained intact as the "Home of the Signal Corps". By January 1948, however, personnel strength had dropped to a total of 11,419. This included 700 officers, 3,221 enlisted men, 3,867 students, and 3,631 civilian personnel.[44]

Within a few months, everything was to change as world tensions increased with the Cold War and the Berlin Airlift. To sustain the Army's worldwide commitments, it again became necessary to enlarge the capacity of every activity on Post. Camp Charles Wood, which had been placed in temporary caretaker status in 1945, was rehabilitated to take care of an increase in personnel for the Signal School. By mid-November 1948, post strength had climbed to 15,296, an increase of nearly 4,000 in less than a year.

SIGNAL CORPS CENTER

In August 1949, the Signal Corps Center was established here as a Class II activity under jurisdiction of the Chief Signal Officer.[45] The Center consisted of the Signal Corps Engineering Laboratories, the Signal Corps Board, the Signal School, the Signal Corps Publications Agency, the Signal Corps Intelligence Unit, the Pigeon Breeding and Training Center, the Army portion of the Armed Services Electro Standards Agency, and all Signal Corps troop units stationed at Fort Monmouth. Concurrently with this action, which took effect on 23 August 1949, Fort Monmouth was redesignated the Signal Corps Center and Fort Monmouth.[46]

In June 1950, with the onset of hostilities in Korea, the President quickly received the necessary authorization to call the National Guard and organized reserves to 21 months of active duty. He also signed a bill extending the Selective Service Act until 9 July 1951.

The Officer Candidate School was reestablished here. Its first class began 24 September 1951. The school continued until 27 April 1953, graduating 24 classes for a total of 1,232 second lieutenants.[47] The number of military personnel here nearly doubled in the period from 1947 to

1953, increasing from 9,705 to 17,358.[48]

The fighting in Korea brought to light the need for new techniques in the conduct of modern warfare. The use of mortars by the enemy, and the resultant need to quickly locate and destroy the mortar sites resulted in development of the Mortar-Radar Locator AN/MPQ-3 and AN/MPQ-10.

The development of new equipment, however, placed requirements on the Signal Corps to provide increased numbers of trained electronics personnel to work in the fire control and guided missiles firing battery systems. To meet this need, Signal Corps Training Units--the 9614th and 9615th--were established at Aberdeen, Maryland and Redstone Arsenal in Alabama. These units provided instruction on electronics equipment used in the Anti-Aircraft Artillery and Guided Missile firing systems.[49]

Here at Fort Monmouth, meanwhile, there were increased student loads in all classes at the Signal School, resulting in establishment of night classes for some of the enlisted courses, particularly Radar.

Between 1951 and 1953, approximately 4,500 scientists and supporting personnel were employed at the Signal Corps Laboratories and sub-installations. They were responsible for production engineering of equipment designed since World War II. By 1952, 250 of 274 pieces of major signal equipment moving to the field were new and improved over their predecessors.

Detection equipment was improved, and significant advances were made in smaller and lighter forward-area equipment, wire communications, meteorological and photographic equipment, nucleonics, radar, and thermionics.

In order to centralize work formerly conducted at Evans, Coles and Squier Laboratories, and the Watson Area, a new research and development engineering laboratory was constructed at Camp Charles Wood. This was Building 2700, later to be called the Hexagon. The first increment of the building was completed in September 1954, and dedication ceremonies were held 30 September 1954.

At the end of the War in Korea, Fort Monmouth was for a time the object of congressional opprobrium and public notoriety. Julius

Rosenberg, executed with his wife for spying in June 1953, had worked for the Signal Corps Labs from 1940 to 1945. He was dismissed early that year when it was learned that he had formerly been a member of the Communist Party, but not before he had given the Soviet Union the secret of the proximity fuse. On 31 August 1953, having received word of possible subversive activities from Fort Monmouth's commanding general, Kirke B. Lawton, the Chairman of the Senate Committee on Government Operations, Senator Joseph McCarthy, launched an inquiry designed to prove that Rosenberg had created a spy ring that still existed in the Signal Corps labs. At first, McCarthy conducted his hearings behind closed doors, but opened them to the public on 24 November 1953. In the end, he failed to prove the existence of a Communist conspiracy at Fort Monmouth. Even so, his actions brought notoriety to the Signal Corps Labs and grief to forty-two employees who were dismissed from their jobs on mere suspicion.[50]

Courtesy of Fort Monmouth Historical Museum.

Research and Development Center, better known as the Albert J. Myer Center, or simply, The Hex.

CONTINUED CONSTRUCTION

When Fort Monmouth welcomed its sixteenth commander, Major General Kirke B. Lawton, on 20 December 1951, plans had been drawn and contracts would soon be let on $25,000,000 in new construction.

By 1953, six new permanent, 500-man barracks had been completed for the Signal School. These were buildings 1200 through 1205, located north and south of Hemphill Parade Ground (Abbey-Whitsell Avenues). The 1200 area was located on previously undeveloped land in the western end of the post.[51] A new Administration Building for the Signal School (Building 1207, Myer Hall) with its various wings housed the school library, reading and reference rooms, classrooms, theater, cafeteria, a post exchange, book store, barber shop, cleaning concession and a laundry (Buildings 1208-1210).[52] Also constructed in this area was Building 1206, an auditorium with an outdoor amphitheater.[53]

Demolition of World War II buildings began in 1954, disposing of wood

structures that had fallen into disrepair. Ten structures were removed from the area of Squier Hall, and an additional nine from the Russel Hall area. Three buildings in the 500 area along Allen Avenue were demolished to make room for a new three-story barracks building. This barracks building (Building 360), completed in 1956, was built to house 60 bachelor noncommissioned officers.

Two major warehouse buildings (Buildings 975-976) were completed in 1954 and replaced World War II troop housing in the 900 area. About 50 World War II buildings in the 1000 area, located in the southern part of the post, were demolished to make way for a new hospital (Building 1075). The new hospital was completed in 1961.[54]

The remaining World War II structures located in the 200 area around Allison Hall were replaced in 1965 by two permanent barracks buildings. These three-story brick structures were designed as Bachelor Officer Quarters (BOQs). Two other BOQs, both similar in design, were built in this area between 1968 and 1971.

Many of the World War II buildings in the 800 area were demolished in 1970 to make way for the present post exchange, cafeteria, post office, and bank complex.

Until recently, several of the World War II cantonment areas remained virtually intact. A program of demolition within the past 15 years, however, has removed many of the World War II barracks. Virtually all of the buildings in the 600, 700 and 800 areas have been demolished, and only scattered examples remain. Some of the buildings in the 400 area, east of Oceanport Avenue, also have been demolished, but enough remain to give a sense of the original World War II plan.

Among the other buildings or structures built or renovated over the years are:

a. **The World War II Memorial** (Building 115), centered on the north side of Greely Field, dedicated 4 October 1952.
b. **Communications Building** (Building 1150), opened in March 1954 and, in dedication ceremonies held 21 June 1956, named Vail Hall in honor of Alfred Vail, inventor of telegraphic instruments. (See Chapter 1, Camp Vail).
c. **Corput Plaza and Corput Plaza Drive**, flagpole area in front of Hexagon Building, dedicated 20 September 1960 in honor

of Major General Rex Van Den Corput, Jr., Director of Signal Corps Laboratories, 1941-1944.

d. **Cowan Park**, flagpole and park area in front of Russel Hall, ded icated 24 June 1961. Named in honor of Colonel Arthur S. Cowan, the third and eighth Commanding Officer of Fort Monmouth.

e. **Post Library** (Building 502) opened in June 1974, renamed and dedicated 21 June 1977 in honor of Major General George L. Van Deusen, eleventh Commanding Officer of Fort Monmouth and first Commanding Officer of the Eastern Signal Corps Training Center.

Several major development programs were completed in the Charles Wood area in the years following World War II and the Korean War. The housing program there was initiated in 1949 with the construction of 11 officers' family housing units. These two-family houses were constructed west of the Officers' Club, along Megill Drive. Ten additional units were constructed in 1951 on a circular drive with access to Megill Drive. An additional eleven housing units were constructed in 1955 west of Hope Road on Hemphill Road.

In 1953, 52 Wherry Housing units were constructed in the Pine Brook area of Camp Charles Wood to provide additional quarters. This housing project, named Eatontown Gardens, was built in three funding increments with a total cost of $6,000,000. It was completed in December 1954.

A program of housing construction financed by the Capehart Housing Act was begun in 1955 when World War II cantonment camps around Colin Kelly Field and Frawley Field, both in Camp Charles Wood, were demolished to make room for the new housing. Actual construction, however, was not begun until 1958. Between 1958 and 1959, 36 housing units were completed. Each structure contains either four or eight two-story apartment units. The final group of Capehart housing units to be built on the World War II cantonment area was completed in 1960. Ten years later, in 1970, 17 additional units were constructed along Tinton Avenue in the Charles Wood area.

In the Evans area, the Signal Corps constructed a large number of wooden buildings, generally radio antenna shelters designed to house radar units. Very few buildings have been constructed at the Evans Signal Laboratory since World War II. Several warehouse and storage buildings

and small test structures are all that have been added.[55]

UNIT MOVEMENTS

In 1954, there was an exodus of almost 1,300 military and civilian personnel as two organizations transferred to Fort Huachuca, Arizona which, in February of that year, was redesignated a Class II installation under jurisdiction of the Chief Signal Officer and placed in an active status.

The Signal Corps Electronic Warfare Center, which had been activated at Fort Monmouth in 1950, was the larger of the two organizations to make the westward trek. The other was the 9460th Technical Service Unit, Signal Corps Army Aviation Center, which had been activated here in 1952 to evolve and test aviation support to Signal Corps activities near Fort Monmouth, and to meet the growing needs of Army aircraft in modern military communications, electronics, and photography. Originally based at Red Bank Airport, the Signal Corps Army Aviation Center later moved its operations to Monmouth County Airport. From there it moved to Fort Huachuca.

As these organizations were departing Fort Monmouth, two other units-although smaller in numbers of personnel--were transferred here from Maryland. On 8 January 1954, the 9463rd Technical Service Unit, Radio Propagation Unit, was transferred here from Baltimore and redesignated the Signal Corps Radio Propagation Agency. Also arriving at Fort Monmouth were 17 instructor personnel of the Signal Supply School which had been discontinued at Fort Holabird, Maryland on 31 January 1954- Most of this group was assigned to the Officers' Department of the Signal School to form a Supply and Maintenance Division.

SIGNAL CORPS ENGINEERING LABORATORIES

After the Korean conflict, a new era of accelerated progress began at the Signal Corps Engineering Laboratories. Personnel were now free to concentrate their efforts on solving electronics problems that would pave the way for future developments.

Important work in radar, countermeasures, physical sciences, and electron devices proceeded at Evans Signal Laboratory. By 1954, 300 of 349 major signal items in production were of modern vintage, improved for

the most part in speed, integration and flexibility.

Among developments by the laboratories were a lightweight field television camera with a back-pack transmitter; a personal atomic radiation dosimeter that clipped in the pocket like a fountain pen; an ultrasonic quartz saw; a high accuracy mortar locator; and super-small experimental field radios.

New equipment training teams were formed by the laboratories to train units in the installation, maintenance and operation of the new equipment. Some 200 soldier specialists conducted training in the United States, Alaska, and Japan.

The Signal Corps Engineering Laboratories also played an important role in the International Geophysical Year (IGY) in 1957-58, cooperating in research efforts by 96 member countries. The laboratories' involvement concerned upper air research, measuring winds and temperatures, by means of rockets. Support was also provided in the earth satellite program. Scientists developed instrumentation for meteorological measurements, as well as instruments for "Cloud Cover", a satellite launched on 17 February 1959 to survey the earth's global cloud paths.

In 1957 Fort Monmouth scientists developed a method for measuring polar ice by using radar. This technique greatly aided the study of the Polar Regions.[56]

As of December 1957, personnel strength at Fort Monmouth totaled 15,859, reflecting overall growth since the Korean War. Included were 1,156 officers and warrant officers, 7,503 enlisted personnel and 7,200 civilian employees.

In April 1958, the US Army Signal Corps Engineering Laboratories were redesignated to the US Army Signal Corps Research Development Laboratory (USASCRDL).[57]

In fiscal year 1958, the laboratory placed increased emphasis on internal research, creating an Institute for Exploratory Research in the Office of Research Operations. Exploratory Research Divisions were also created in each of three operating departments. The consolidation of internal research efforts was completed when the Institute for Exploratory Research was given department status and the three Exploratory Research Divisions were transferred from the departments to the

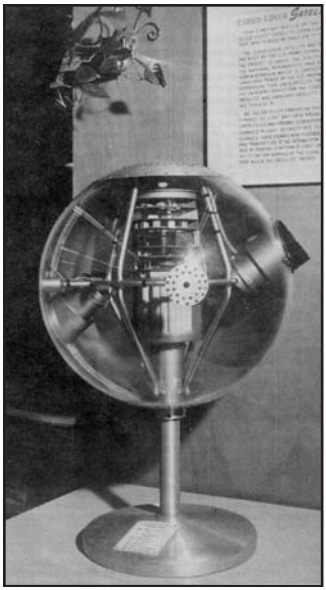
Institute.[58] This was the final step in fostering a research organization free from the pressures, which characterize development activities. A Computational Analysis Division was also established within the institute to provide a mathematical and computational service.

To give proper recognition and priority to astro-electronics projects, an Astro-Electronics Division was established in the Communications Department.[59] The division embraced Astro-Instrumentation, Astro-Observation and Analysis, and Astro-Communications Branches.

SATELLITES

The Signal Corps and its Fort Monmouth activities, which had opened the space age electronically on 10 January 1946 by bouncing radio signals off the moon in Project Diana, continued its space-related activities through support of the satellite activities associated with the International Geophysical Year in 1957-58.

On 17 March 1958, the Signal Research Development Laboratory accomplished a major satellite payload contribution with the launch of Vanguard I; demonstrating the feasibility of solar converters for satellites. Solar-powered devices, consisting of six cell clusters, were developed by the laboratory to power one of the two radio transmitters in the 3-1/4 lb, 6.4 inch sphere.



Courtesy of Fort Monmouth Historical Museum.

The Vanguard II Satellite.

Three minutes after launch of the Vanguard I from Cape Canaveral in Florida, its signals were picked up at the Deal Test Station of the laboratory. In the first three years of its existence, Vanguard I traveled 409,257,000 miles in 11,786 orbits. Its radio voice never failed, and it proved itself invaluable in scientific computations. Vanguard I has a predicted life of 200 to 1,000 years and its solar cells, and perhaps its radio, should continue to operate as long as it circles the globe.

The second major satellite payload contribution was the complete electronics package for Vanguard II, launched on 17 February 1959.

This satellite, with infrared scanning devices to provide crude mapping of the earth's cloud cover and a tape recorder to store the information, operated perfectly during the entire 20-day life of the battery power source.

The first communications satellite, Project SCORE (Signal Communications via Orbiting Relay Experiment), was successfully launched 18 December 1958. It was used to broadcast a Christmas message from President Dwight D. Eisenhower to people around the world. The experiment effectively demonstrated the practical real-time feasibility of worldwide communications in delayed and real-time mode by means of relatively simple active satellite relays. SCORE was a project of the Advanced Research Project Agency (ARPA), conducted by the Signal Corps. The Air Force provided the Atlas launching vehicle. In addition to its work with satellites, the laboratory developed and tested equipment to fit into the new concept of rapid and flexible communications.

From 1959 to 1960 scientists at Fort Monmouth participated in Project WOSAC or the World Wide Synchronization of Atomic Clocks. The project, carried out with the aid of the U.S. Navy, U.S Air Force, Harvard University, and the British Post Office, established a global standard for time measurement.[60]

6
AMC/ECOM

REORGANIZATION

A reorganization of the Army in 1962 resulted in some significant changes for Fort Monmouth.

In response to a study directed by the Secretary of Defense, the Army reviewed its managerial practices in order to achieve more efficient and economical operation and eliminate unnecessary overlap and duplication of effort.

One segment of the Army study embraced the Technical Services, one of which was the Signal Corps. As a result, the Signal Corps and the other Technical Services ceased to exist. Their functions were transferred to new commands. Signal Corps functions, for instance, would no longer be under the purview of the Chief Signal Officer. Management of Signal Corps personnel was given to the Office of Personnel Operations (OPO); signal training was transferred to the Continental Army Command (CONARC); signal doctrine and combat development to the Combat Development Command (CDC); and signal materiel development and procurement to the Army Materiel Command (AMC).[61]

AMC came into being 1 August 1962 as the first centralized logistics command to exist in peacetime. On the same day, a subordinate element of AMC was established at Fort Monmouth. This was the US Army Electronics Command (USAECOM).[62]

The USAECOM mission was to exercise integrated commodity management of assigned materiel within the concept of cradle to-grave management.

Specifically, the command was responsible for research, design, development, product and maintenance engineering, industrial mobilization planning, new equipment training, wholesale inventory management, supply control, and technical assistance to users in the commodity areas of communications, electronic warfare, combat surveillance, automatic data processing, radar, and meteorological materiel.

Major General Stuart Hoff was appointed the first Commanding General

of ECOM, effective 1 August 1962. He simultaneously became the 22nd Commanding Officer of Fort Monmouth.

The initial effort at reorganizing Army electronics materiel management carried with it a major organizational deficiency. Previously, field agencies had reported to the Office of the Chief Signal Officer--the only staff interposed between them and the Department of the Army (DA). The reorganization aggravated this situation by creating two levels between the units and DA. These were ECOM and Headquarters, AMC. A study was initiated almost immediately to design a better organization for ECOM.

In July 1964, a restructuring of the command was implemented.[63] It was a logical continuation of the US Army reorganization of 1962, and made ECOM a cohesive operating command of AMC. The objectives of the restructuring were to consolidate missions and eliminate command and staff layering; to collocate principal mission and operating functions of research and development, procurement and production, and materiel readiness and to establish ECOM as the primary authoritative point within the Department of Defense for integrated life-cycle management of assigned commodities.

In essence, the ECOM reorganization established a directorate-type organization that combined the former headquarters staff with the operating elements of corresponding functional areas.

Courtesy of Fort Monmouth Historical Museum.

Fort Monmouth, NJ (early 1960's). Signal Corps Center and School 1200 Area.

Major organizational changes within ECOM's research and development operations were accomplished in 1964 and 1965. Initially, a supervisory research and development staff was eliminated and staff supervision within the US Army Electronics Laboratories was streamlined. In July 1964, the laboratories were designated the US Army Electronics Laboratories and authorized a personnel strength of 94 officers, 143 enlisted personnel, and 2,725 civilian employees.[64]

In January 1965, a laboratory for Combat Surveillance and Target

Acquisition was organized as an element in the Electronics Laboratories.[65] The following month an Avionics Laboratory was organized, again as an element within the Electronics Laboratories.[66]

Within a few months, and as a result of an ECOM study, other major areas of research and development were organized into laboratory-type organizations. Included were communications, electronic warfare, and atmospheric sciences.

On 1 June 1965, the Electronic Laboratories were discontinued and six separate laboratories were organized. These were Electronic Components Laboratory, Communications/ADP Laboratory, Atmospheric Sciences Laboratory, Electronic Warfare Laboratory, Avionics Laboratory, and Combat Surveillance and Target Acquisition Laboratory. Also organized were a Directorate of Research and Development and an Institute for Exploratory Research.[67]

The new organization was designed to provide greater efficiency and responsiveness in meeting the ECOM R&D mission. The new Directorate of R&D was authorized 11 officers, 87 enlisted personnel, and 1,102 civilian employees.[68]

ECOM, in its 16 years of constant change and reorganization did accomplish its assigned mission. During this time, the laboratories produced some famous "firsts". Among them were:

- **First televised weather satellite**-- The Tiros-1 satellite, developed under the technical supervision of the Fort Monmouth Laboratories, sent to the giant 60 foot "Space Sentry" antenna at Fort Monmouth the first televised weather photographs of the earth's cloud cover and weather patterns. (1960)

- **First Large Scale Mobile Computer**-- MOBIDIC, the Mobile Digital Computer, developed at Fort Monmouth, was the first computer developed for use at Field Army and theater levels. This van-mounted computer was the first experiment in automating combat support function in artillery, surveillance, logistics and battlefield administration. (1960)

- **First High Capacity Communication Satellite**-- The Courier Satellite, developed and built under the supervision of the Fort Monmouth Laboratories, was the experimental com-munications

satellite that proved high-volume communications, up to 100,000 words per minute, could be relayed through space. (1960)

- **Hand-held Radar** -- A 10-pound experimental unit that could spot moving targets a mile away. (1962)

- **Morse Code Readout**-- This device, developed at Fort Monmouth, plugs into any Army radio and transforms the dots and dashes of Morse Code into letters formed by a light-emitting diode (LED). This device allows a soldier with no knowledge of Morse Code to be able to receive coded messages. (1964)

- **Multi-Channel Laser Relay** -- A single pencil-size laser beam that acted as a relay of many television and radio channels. (1965)

- **Microelectronics** -- Circuitry that was more reliable, used less power, and was less costly. Primary usage was for computers. (1966)

- **Night Vision** -- Development and deployment to Vietnam of passive night vision device that, by using image intensifier tubes, made targets almost as visible at night as in daylight. (1968)

- **Radio Ground Beacon**-- The Electronics Command fielded a small omni directional radio ground beacon, the AN/TRN-30, for Army aircraft. The beacon is for use at remote airstrips and landing facilities.

- **Defibrillator Pacemaker** -- Developed in cooperation with doctors from Patterson Army Hospital, the device regulated the heartbeat but, in addition, could detect the start of fibrillation (wild tremor of the heart's muscle) and briefly stop the heart to allow normal beat to resume. (1972)

- **Carbon Dioxide Communications Laser** -- An air-cooled dioxide laser communications system with a range of five miles. (1973)

- **Lithium Battery** -- Testing of lithium batteries that potentially have four times the life of carbon-zinc and twice the life of magnesium batteries. (1974)

- **Mortar and Artillery Locating Radars** -- AN/TPQ-36 and AN/TPQ-37. (1975)

- **Automatic Telephone Central Office**-- The solid state AN/TTC-38 is smaller and lighter than manual switch systems, is faster and more easily maintained. It gives the user touch-dialing to anywhere in the worldwide military telephone system.

- **Laser Mini-Rangefinder** -- Small rangefinder weighing less than one pound that can be mounted on small arms and is accurate up to distances of one kilometer. (1974)[69]

By the time ECOM observed its 10th anniversary in 1972, the Vietnam War was tapering off and priorities were shifting. Research and Development received increased emphasis for the design and development of the next generation of the military's electronic needs.

As it entered its second decade, ECOM's personnel strength was over 1,350 military and more than 10,250 civilians. The majority of the personnel--approximately 7,200 civilian and 900 military--were at Fort Monmouth, with the remainder at ECOM Philadelphia and at Fort Belvoir, Virginia, among other smaller contingents.[70]

SIGNAL SCHOOL TRANSFER

With the Army's reorganization in 1962, the US Army Signal Center and School (USASCS) had been transferred to the US Army Continental Command (USACONARC). The school, however, was still physically located at Fort Monmouth. The old troika of the post, school and laboratory, formed in September 1919, was broken up with the official closing and transfer of the school to Fort Gordon, Georgia, 31 October 1976. The phase-out, begun in 1972, culminated with graduation of the last class in signal communication on 17 June 1976.[71]

The movement of the school involved the transfer of only 89 civilians who had elected to accompany the school. More than 700 others were either reassigned to other agencies on post or retired.

7
ECOM TO CERCOM/CORADCOM TO CECOM

The story of the changes leading ultimately to the activation of CECOM, the Communications-Electronics Command, began in December 1973 with the establishment of the Army Materiel Acquisition Review Committee (AMARC). This committee was charged by the Secretary of the Army to find ways to improve "current Army organization and procedures for materiel acquisition", and to do so within 100 days.

The committee's report, released 1 April 1974, concluded that the Army's standard commodity command structure, with its emphasis on "readiness", limited flexibility and impeded the acquisition process. It recommended that research and development (R&D) functions be separated from readiness functions within the Army Materiel Command (AMC) and that the disparate and scattered R&D activities of AMC be consolidated in six development centers.

For most of the major subordinate commands within AMC, this meant a simple two-for-one split. For ECOM, the Electronics Command, however, the picture was more complicated. AMARC concluded that the breadth of ECOM's responsibilities "tended to defocus the organization's responsiveness to modern mission-oriented needs". It therefore proposed not a split, but a splintering, transferring the Avionics, the Combat Surveillance and the Electronic Warfare R&D missions to Development Centers that were not to be headquartered at Fort Monmouth.

This was not a popular recommendation. Within days, community leaders joined Fort Monmouth personnel in a vigorous "Save the Fort" campaign that resulted in more than 50,000 letters being sent to the Secretary of the Army. These letters attracted White House attention and twice obliged the Army to reassess its reorganization plans. The letter writing campaign had some effect. The Army's initial plan, announced on 1 April 1976, would have cost the Fort 780 jobs. The final plan, announced on 13 July 1977, left the Electronic Warfare mission at Fort Monmouth and resulted in the elimination or transfer of only 418 personnel.

As of that date, much of AMARC was already implemented. The Aviation Systems Command, soon to become the Aviation Research and Development Command, had assumed operational control of the Avionics Laboratory and PM, NAVCON.

ERADCOM, the Electronics Research and Development Command, established provisionally on 30 March 1977, assumed operational control of its assigned elements on 15 July.

So did CORADCOM, the Communications Research and Development Command, which was established provisionally under Brigadier General William J. Hillsman, who was the Project Manager for Army Tactical Data Systems (ARTADS). He led the task force that planned the organization of the new command.

At Alexandria, Virginia, meanwhile, the Army Materiel Command (AMC) was redesignated the US Army Materiel Development and Readiness Command (DARCOM) with no change in mission.

Activation of the new commands--CERCOM (Communications-Electronics Readiness Command), CORADCOM and ERADCOM--was planned initially for 1 October 1977. However, the date was slipped to 1 January 1978, partly to permit review of revisions imposed on the CERCOM organization concept by Major General John K. Stoner, the ECOM Commander, and partially to accommodate additional planning necessitated by a DA-imposed reduction of 500 spaces in the Headquarters Installation Support Activity (HISA), along with a reduction in average grade and a reduction in the number of high-grade positions permitted in the two new commands.

Activation ceremonies for the new commands were held 3 January 1978 in the Field House. General John R. Guthrie, DARCOM Commander, officiated, handing the flag of CERCOM to Major General John K. Stoner and the CORADCOM flag to Major General Hillman Dickinson.

In the insuing three years and four months of operation, the two commands made significant contributions. They also encountered problems.

The separation of acquisition from readiness gave the research and development community the visibility AMARC thought it needed. However, it was costly. Separation meant duplication. Each command

required an administrative staff, which, at that time of constrained resources, meant the diversion of personnel from mission activities. There also was a duplication of effort in the mission activities, and overlapping areas of responsibility that used manpower simply to ensure a coordination of effort. Such duplication affected performance most severely in integrated logistics support, in initial fielding, and in long-term field support. It was also apparent in production engineering and product assurance.

AMARC, however, was an experiment, not a solution. The AMARC committee itself, insisted on periodic review, updating and revitalization of the measures it proposed to improve materiel acquisition. It was only natural, therefore to "revisit AMARC" when, in February 1979, General Guthrie, the DARCOM Commander, voiced concern about the impact of continued manpower reductions on the mission performance of DARCOM commands.

Review of the Army electronics community began in August 1980. A marked improvement was noted in the electronics R&D capability, but the review committee found a weakening in the readiness capability. This they attributed to diverging workload and fixed resources. Addressing this imbalance, the review team decided there was a need for greater economy and greater flexibility in the use of existing manpower resources. This could be achieved by pooling the resources of the two commands headquartered at Fort Monmouth. This would eliminate duplication, and control could be assigned to one commander with the authority to move personnel as required to meet the most pressing needs. Hence, a decision was announced in December 1980 that CERCOM and CORADCOM would merge and become the Communications-Electronics Command (CECOM) effective in May 1981.

CECOM was to be structured to assure that materiel acquisition not be totally submerged in the new command as it had been in the old commodity command of pre-AMARC. The Development Center of the new command was to have a General Officer in charge, also serving as Deputy Commander for Research and Development, to assure that R&D in CECOM retained the visibility obtained under AMARC.

8
FORT MONMOUTH IN THE 1980'S

CECOM

The US Army Communications-Electronics Command (CECOM), the host unit at Fort Monmouth, was established 1 May 1981, combining the previously separate but co-located resources of the US Army Communications-Electronics Readiness Command (CERCOM) and the US Army Communications Research and Development Command (CORADCOM), both of which were disestablished the same day.

Major General Donald M. Babers, CERCOM and Fort Monmouth commander since June 1980, became the first Commanding General of CECOM, and continued in his role of post commander.[72] Colonel Robert D. Morgan, nominee for Brigadier General, was appointed Deputy Commander for Research and Development and Commander of the Research and Development Center; and Colonel Robert G. Lynn, also a nominee for Brigadier General, was appointed Deputy Commander for Materiel Readiness. Both were promoted to Brigadier General on 31 July 1981.

Courtesy of Fort Monmouth Historical Museum.

Major General Donald M. Babers, the first Commanding General, CECOM, Fort Monmouth.

Essentially, CECOM was charged with the responsibility for research, development, engineering and acquisition of assigned communications and electronic systems; and management of all materiel readiness functions associated with these systems and related equipment.

Research facilities of the command included the Center for Tactical Computer Systems (CENTACS), which conducted research and development in computer science and systems, including hardware and software for diverse applications; The Center for Communications Systems (CENCOMS), that researched programs to produce advanced communications technology, equipment and systems. Its goal was to achieve survivable, mobile, intercept- and jam-resistant battlefield communications; and the Center for Systems Engineering and Integration (CENSEI), the Army's system engineer for Tactical

Command, Control and Communications. CENSEI's aim was to produce a well-engineered, affordable and evolutionary system design.

A Program Manager directed the Test, Measurement and Diagnostic Equipment (TMDE) modernization effort. Reporting to him were two product managers -- for Test, Measurement and Diagnostic Systems; and for Army Test, Measurement and Diagnostic Equipment Modernization.

In addition, there were eight project managers (PMs) within CECOM. These are Army Tactical Communications System (ATACS)/Mobile Subscriber Equipment (MSE); Position Location Reporting System/Tactical Information Distribution System (PLRS/TIDS); Satellite Communications (SATCOM/SATCOMA); Field Artillery Tactical Data Systems (FATDS); Single Channel Ground and Airborne Radio Systems (SINCGARS); Operations Tactical Data Systems (OPTADS); Multi-Service Communications Systems (MSCS); and Firefinder Remotely Monitored Battlefield Sensor System (REMBASS) which was transferred to CECOM from the Electronics Research and Development Command (ERADCOM) on 30 March 1984.

In 1987, the Army established a series of Program Executive Offices (PEOs) in order to consolidate and better manage the vast array of Program Managers responsible for major acquisition programs in the inventory. PEOs for Communications Systems, Command and Control Systems, as well as Intelligence/Electronic Warfare and Sensors were created to manage all of the electronics programs. These offices were closely associated with CECOM due to the nature of their mission. They received significant technical, logistical and program management support from CECOM, but reported directly to the Assistant Secretary of the Army for Acquisition, Logistics and Technology ASA (ALT).

The command added a Software Development and Support Center in October 1984. Located in Building 1210, a former Signal School classroom building, the center conducted software development and life cycle software support activities associated with the Army communications equipment.[73]

Field offices in various parts of the United States and Europe supported CECOM's research and development efforts, as well as the procurement and readiness functions. TASA, CECOM's Television-Audio Support Activity, at Sacramento, California was the Army life-cycle manager for non-tactical, commercial broadcasting and television equipment for the

Army forces. This was subsequently transferred to the US Army Information Systems Command.

During this decade there were a number of separate agencies within CECOM that were responsible for supporting all the systems in CECOM's inventory. CECOM's National Inventory Control Point (NICP) played a key role in keeping fielded communications and electronics equipment in a high state of readiness. This task included worldwide materiel management of communications-electronics systems and support items. Complimenting the NICP was the command's National Maintenance Point (NMP), which provided maintenance and engineering expertise on maintainability of communications-electronics materiel from conception to obsolescence.

In addition to the offices mentioned above, certain CECOM activities were managed at locations aside from Fort Monmouth. The Communications Security Logistics Agency (CSLA), based at Fort Huachuca, Arizona provided commodity management of communications security equipment, aids, and accountable spare parts.

The Electronics Materiel Readiness Activity (EMRA), Vint Hill Farms Station, Warrenton, Virginia, furnished commodity management and depot-level management for signal intelligence/electronic warfare equipment and systems. It supported Army Intelligence and Security Command (INSCOM) and other Signal intelligence and electronic warfare units and activities worldwide.

The CECOM Logistics and Readiness Center (LRC) was established on 10 November 1987 to act as an overseer to all communications-electronics logistics functions within CECOM. Its mission is to support the US Army by providing integrated, timely, cost-effective, and high quality worldwide logistics support to include fielding, new equipment training, operations, maintenance, and sustainment. In addition, the LRC is also responsible for all Foreign Military Sales (FMS) and communications security programs, and to manage Level II and Level III programs having completed their initial development and fielding.

POST IMPROVEMENTS

During the 1980's, the physical area of Fort Monmouth encompassed the main post area, the Charles Wood Area, and the Evans Area nine miles to the south. All of the other sub-installations were closed or

released to the General Services Administration for disposal. The last large area to be identified for disposal was the Coles Area on Newman Springs Road west of Red Bank. It was declared excess in March 1974 and officially closed 1 January 1975.

The post continued to grow with the construction of new facilities through the years. A new interdenominational Chapel was dedicated in July 1962; a Bowling Center opened in December 1965; dedication of the Post Exchange complex took place in February 1970; the Commissary opened in April 1971; Green Acres, now the CECOM Office Building, opened Officially in November 1973; the Credit Union Building, and the Post Exchange Service Station and Convenience Store in the Charles Wood Area opened in March 1975; the post library opened in June 1974. In 1977, it was dedicated as the Van Deusen Library in honor of the 1941-42 post commander and Signal School Commandant.

Courtesy of CTSC Visual Information Services.

CECOM Office Building.

In the 1980s, multi-million dollar projects resulted in upgrading and modernizing of the Myer Hall complex and barracks in the 1200 area; the Communications Center (Vail Hall); Russel Hall and Squier Hall. Also, a program began in July 1982 to modernize the Hexagon (Building 2700). Major objectives of a three-phase Hexagon modernization program included the installation of air conditioning; installation of energy-saving wall and window insulation; accommodations for the handicapped; installation of additional elevators; replacement of existing communications equipment: and alteration of building elements to conform to health safety and fire codes.

A new NCO/Enlisted Club opened 10 November 1983. The first phase of construction for the club, built in the area between the post service station and Husky Brook Pond, provided a facility with fast food service and a bar, but no kitchen. A kitchen and dining room were added in subsequent construction.

JOINT TACTICAL COMMAND, CONTROL AND COMMUNICATIONS AGENCY

This Department of Defense organization was established at Fort Monmouth on 10 September 1984, with Major General Norman E. Archibald as Director. The agency was chartered to ensure interoperability among tactical command, control and communications systems used by U.S. Armed Forces; and to develop and maintain a joint architecture, systems standards and interface definitions for tactical/mobile command, control and communications systems.

The agency, headquartered in Russel Hall, unites four former defense elements--the Joint Tactical Communications Office and the Joint Interface Test Force, both at Fort Monmouth; the Joint Test Element, Fort Huachuca, Arizona; and the Joint Interoperability of Tactical Command and Control Systems Program, Washington--under the leadership of a single director.[74] This office was later reorganized into the JIEO (Joint Information Engineering Organization), and was subsequently separated into various other organizations during the next 15 years.

US ARMY CHAPLAIN CENTER AND SCHOOL (USACHCS) AND CHAPLAIN BOARD

The Army's Chaplain Center and School, the Army's only training center for the clergy, moved here in 1979 from Fort Wadsworth, N.Y. It conducted resident training for over 1,000 students per year, including 700 enlisted chaplain activity specialists and 300 chaplains in both the officer basic and advanced courses.

The school, which was transferred to Fort Jackson, South Carolina during the 1990's, was headquartered in Watters Hall (Building 1207), formerly Myer Hall. The building was renamed in ceremonies on 30 July 1984 commemorating the 109th anniversary of the Army Chaplaincy. Chaplain (Major) Charles J. Watters, a Catholic Priest of Jersey City, N.J. was killed in action in Vietnam and posthumously awarded the Medal of Honor by President Nixon in 1969.[75]

The Chaplain Board, a field operating agency of the Chief of Chaplains, moved here in September 1979. It executed programs in support of

various religious and moral activities of the Army, focusing on meeting the changing needs of the soldier. The board also assists the Chief of Chaplains in developing concepts of ministry and professional guidelines for chaplains and religious activities.

US ARMY INFORMATION SYSTEMS MANAGEMENT ACTIVITY (ISMA)/PROJECT MANAGER, DEFENSE COMMUNICATIONS SYSTEMS-ARMY

Located in Squier Hall (Bldg 283), ISMA was formerly the Communications Systems Agency (CSA) and is assigned to the Army Information Systems Command, previously the Army Communications Command at Fort Huachuca, Arizona. The changes resulted in identification from the establishment by the Army in mid-1984 of a staff agency and a major command to coordinate the modernization of the Army's information management, communications-command and control systems. Thus, the Army Communications Command at Fort Huachuca and the Army Computer Command at Fort Belvoir, Virginia, and their associated agencies, were merged to form the new Information Systems Command (USAISC).

The Information Systems Management Activity (ISMA) here is a subordinate command of USAISC and a project management office of the Army Materiel Command. The activity handled the acquiring and fielding of a wide variety of information and telecommunications systems in support of the worldwide Defense Communications System. In addition to undertaking projects for the Army, Navy and Air Force, the activity supported the State and Commerce Departments, the National Security Agency, the Federal Aviation Administration, and foreign allied governments in improving the modernizing their communications systems.[76]

513th MILITARY INTELLIGENCE GROUP

The 513th Military Intelligence Group was activated here in September 1982, along with three subordinate units: the 201st, 202nd and 203rd Military Intelligence Battalions. All are located here except the 203rd which is headquartered at Aberdeen Proving Ground, Maryland.[77]

Activation of the units--all assigned to the US Army Intelligence and Security Command--resulted in an additional 375 military personnel being stationed here. When fully staffed, the 513th is expected to result

in an increase of about $7 million in the post's annual military payroll.

The units were activated in response to increasing military requirements to provide rapid and accurate intelligence support to military commanders responsible for planning and executing peacetime, contingency, and wartime operations.

MODERNIZING THE FORCE

If a single phrase characterized the 1980s, it was "Force Modernization", based on technologies developed largely in the 1970s. The introduction of tactical ADP (Automated Data Processing) systems gave the American soldier new battlefield capabilities no other Army possessed. CECOM also introduced new secure communications systems, including Single Channel Ground and Air Radio System (SINCGARS) and Mobile Subscriber Equipment (MSE). CECOM took the lead in finding ways to shorten the acquisition cycle through procurement of nondevelopmental items. CECOM also took the lead during the 1980's in standardizing tactical computers and software.

Concurrently, CECOM embarked upon an extensive internal reorganization. One motivating factor was the continuing budget challenge within the Federal Government which dictated belt tightening and a renewed search for more efficient ways of doing business. The changes included the creation of a C3I Logistics and Readiness Center and the establishment of the U.S. Army Garrison Fort Monmouth. CECOM also assumed responsibility for Vint Hill Farms Station, Virginia, and its Garrison, which previously belonged to the Intelligence and Security Command.

In 1989, Fort Monmouth won the "Army Community of Excellence" award in the Large Installation category. The award recognized the excellence of the service Fort Monmouth organizations rendered to the Army at large, as well as the sustained effort on the part of employees and residents alike to beautify the installation and improve the quality of life in the workplace.

CECOM COMMANDERS DURING THE 1980's

Major General Donald M. Babers, CECOM's first commander, was selected for promotion to Lieutenant General and reassignment in October 1982. He moved to Headquarters, US Army Materiel

Development and Readiness Command (DARCOM) as Deputy Commanding General for Readiness. Replacing him as CECOM Commander, and becoming the 30th commander of Fort Monmouth, was Major General Lawrence P. Skibbie. General Skibbie was to command until June 1984 when he too was promoted to Lieutenant General and transferred to Headquarters DARCOM.

Courtesy of Fort Monmouth Historical Museum.

Major General Lawrence P. Skibbie, the second Commanding General of CECOM, Fort Monmouth from 10/82 - 6/84.

Brigadier General Robert D. Morgan, who had served CECOM both as Deputy Commander for Research and Development and Deputy Commander for Readiness, succeeded General Skibbie as CECOM Commander. He became the 31st Commanding Officer of Fort Monmouth. He was promoted to Major General in September 1984.

On 1 August 1984, CECOM's parent command, the US Army Materiel Development and Readiness Command (DARCOM) was redesignated the US Army Materiel Command (AMC), its original designation from 1962 to 1976.

Following Major General Morgan's departure on 15 May 1987, the 32nd and final Commanding General of CECOM in the 1980's was Major General Billy M. Thomas, who occupied the position until July of 1990.

Courtesy of Fort Monmouth Historical Museum.

Major General Billy M. Thomas, Commanding General of CECOM, Fort Monmouth from 5/87-7/90.

Courtesy of Fort Monmouth Historical Museum.

Major General Robert D. Morgan, Commanding General of CECOM, Fort Monmouth from 6/84-5/87.

9
CECOM AND THE GULF WAR

Many of us can remember exactly where we were and what we were doing when the United States launched air strikes against Iraq on January 17, 1991 in an attempt to liberate Kuwait. For many Americans, this was the start of a new era in history, but for CECOM, the beginning had started long before then.

It was up to CECOM to equip and sustain the force with the communications and electronics equipment it needed to fight. This was not an easy task. Units arrived in theater with only the equipment they owned. Some units had newer equipment, but most units had at least some systems that were incomplete or in desperate need of repair. The Army, and CECOM in particular, had to fill these gaps either through accelerated fieldings of new equipment, or by reissuing items in theater before the ground offensive.

On 7 August 1990, CECOM's Emergency Operations Center (EOC) began operating twenty-four hours a day, seven days a week to address the situation. Although several organizations within CECOM set up their own crisis management centers, the EOC was to serve as CECOM's focal point for all actions relating to the crisis in the Middle East. Employees worked around the clock in order to equip our soldiers with everything from radios and jammers to night vision and intelligence systems. From day one of deployment, CECOM worked to sustain the equipment out in the field and ensure any follow-on items that arrived in theater were as mission-ready as possible.

Between July 1990 and February 1991, the CECOM Readiness Directorate completed 1,318 fieldings, many of which were accelerated specifically to meet the requirements for Desert Shield/Desert Storm. For example, in order to equip the 1st Cavalry Division with SINCGARS radios before its deployment, CECOM managed to issue the system to an entire brigade within one week. This included not only the radios themselves, but also the operator and maintenance support training needed to sustain them. Before it was all over, CECOM would repeat this same accomplishment in theater three more times. This is simply one example of many that demonstrate CECOM's great efforts in support of our soldiers.

In addition to the efforts mentioned above, CECOM supported the war effort through the purchase of commodities – the consumables, repair parts and replacement items that keep our forces viable wherever they operate. This complex, time consuming process ordinarily involves item managers, contracting officers and other employees across several organizations and functional areas. Due to the immediate needs of our forces deployed overseas, many of these administrative processes were temporarily suspended. By the end of the crisis, CECOM processed close to 180,000 requisitions, shipped six million pieces of equipment worth over $1.1 billion (including four million batteries), initiated 456 urgent Procurement Work Directives valued at $113 million, and procured a total of 10.8 million pieces of equipment worth $326 million.

CECOM also established a Communications Security (COMSEC) Management Office in Saudi Arabia that opened 15 November 1990. While most theaters traditionally have a communications command responsible for managing COMSEC issues, one had not been set up for Operation Desert Shield (the reserve unit ordinarily assigned to Central Command, or CENTCOM, was not deployed due to obsolete equipment), thereby making the Army Theater COMSEC Management Office (TCMO) a significant development. Recognizing the need for dedicated COMSEC support in Saudi Arabia, CECOM acquired the necessary authorizations, resources and space to set up at the Royal Saudi Air Force Base in Riyadh. Shortly after operations commenced, TCMO came under the direct control of CENTCOM, and remained operational until May 1991.

During Desert Shield/Storm, CECOM also made extensive use of Logistics Assistance Representatives (LARs). Whenever soldiers in the field asked for help regarding their equipment, CECOM LARs were invaluable in providing assistance. LARs were civilian employees (GS-11 through GS-13) from the Readiness Directorate who provided hands-on technical assistance when needed. These LARs deployed to Saudi Arabia along with the divisions, making them among the first civilians to arrive in the war zone. Within seventy-two hours of receiving the full deployment alert for Operation Desert Shield, CECOM had forty-eight LARs ready to deploy. That tradition has continued, and today CECOM has over 225 representatives deployed around the globe to provide on-site technical support where needed.

While many CECOM employees distinguished themselves during this time, contractors also played a vital role in the Gulf War. Technical

assistance from contractors became necessary in some cases when systems in theater were very recently developed and the effects of the desert (such as the intense heat) on this equipment was not fully understood. In many cases, CECOM had planned on developing a support capability within the organization, but simply could not do so before the system was sent to the Gulf. In other cases, especially with older items, CECOM no longer had the ability to maintain them, and contractors provided the necessary support.

Batteries, what one might consider one of the simplest of supply items, created a huge challenge for CECOM. Peacetime stocks were not large enough to meet wartime demands and batteries never lasted very long, especially in the intense desert heat. To make matters worse, just about every item in CECOM's inventory not only required them, but a lot of them. By the time the Air Campaign started in January 1991, battery producers were told to work around the clock, which they did until the conclusion of the ground war in early March. In addition, different pieces of equipment, such as radios and night vision devices, demanded different types of batteries. Ensuring there were enough batteries, and that the right equipment received the right battery, became a gigantic logistical concern for CECOM. CECOM decided to push shipment into theater to a single control point for distribution, rather than filling individual requisitions as they were received.

There were many lessons to be learned during Operations Desert Shield and Desert Storm for DoD, the Army, and for CECOM. Although the Gulf War was viewed as an overwhelming success for our nation, our experience there demonstrated the undeniable need for enhanced communications and more integration on the battlefield along with a better logistics infrastructure. These lessons would become the impetus that would shift our military strategy towards one that emphasized information dominance rather than brute force.[78]

10
A DECADE OF REALIGNMENT AND DIGITIZATION--1990'S

The missions of CECOM and related Fort Monmouth organizations acquired enhanced significance in the 1990s when the Army Chief of Staff defined the Army's role in the new world order and identified requirements for decisive victory, to own the spectrum, own the night, know the enemy, and digitize the battlefield.

Despite the important role it played in supporting these requirements, CECOM and Fort Monmouth paid their share of the "peace dividend." From 30 September 1990 to 30 September 1995, CECOM's worldwide civilian workforce fell from 7,375 to 6,501, while its military strength dropped from 1,035 to 555. During the same time, the number of civilians assigned to all organizations at Fort Monmouth, including CECOM, fell from 7,732 to 6,385; the number of military fell from 1,826 to 761. Fort Monmouth's military population in 1990 included 726 soldiers in units (the 513th MI Brigade, the 235th Signal Company, and the 535th Engineer Company) that moved in 1993 to other installations.

Although the size of the force it supported decreased during this time, CECOM experienced little if any diminution in its workload. This situation challenged its leadership first, to find ways of reducing the civilian workforce without resorting to involuntary separations; then, to accomplish its mission with the remaining resources without sacrificing quality or service to the customer.

CECOM's leadership met the first of these challenges by imposing strict hiring freezes, offering incentives for voluntary early retirement or separation, and reassigning employees from eliminated positions to vacant positions of higher priority. It addressed the second challenge, initially, through a large-scale reorganization that focused on vertical integration (the development of multi-functional mechanisms for the management of weapon systems from cradle to grave) and through the development of a workforce committed to the principles of Total Quality Management. Subsequently, the Command focused its work on the objectives of the Total Force, as defined by Department of the Army, and on the "core competencies" of the Army Materiel Command —

Technology Generation and Application, Acquisition Excellence, and Logistics Power Projection.[79]

BASE REALIGNMENT AND CLOSURE (BRAC)

During the Cold War, the primary threat to America's national security was the Soviet Union, and our military equipment, doctrine and training was centered around effectively dealing with this threat. While the conclusion of the Cold War meant the threat was diminished, our infrastructure had not adjusted accordingly. This imbalance of forces and threats led many to believe there were more bases than were needed. The first round of Base Realignment and Closure (BRAC) occurred in 1988, and by 1991, Fort Monmouth was already being impacted with the decision to move the Electronics Technology and Devices Lab (ETDL) out of Fort Monmouth to Adelphi, Maryland.

For CECOM, the most significant changes occurred during BRAC 93. As a result of this third round of BRAC, the Chaplain Center was transferred from Fort Monmouth to Fort Jackson, South Carolina. The Belvoir Research, Development and Engineering Center (BRDEC) was realigned in place at Fort Belvoir, with some BRDEC positions realigned to CECOM. The CECOM Office Building, located in Tinton Falls, NJ, was vacated and 2,300 employees moved onto Fort Monmouth. The Evans Area, a sub-post of Fort Monmouth located in Wall, NJ, was closed and 500 employees also relocated to main post and the Charles Wood Area. BRAC 93 also saw the closing of Vint Hill Farms Station in Virginia, and 712 spaces came to Fort Monmouth. In addition, the Army was required to dispose of 264 excess housing units in the Charles Wood Area, which it turned over to the Navy.

BRAC 95 involved moving additional tenant personnel from Fort Dix and Bayonne to Fort Monmouth, and the gain of the logistics and acquisition support positions supporting the BRDEC business areas that were realigned to CECOM via BRAC 93. Another BRAC '95 decision closed the Aviation and Troop Command in Saint Louis and reassigned nearly 180 of its procurement and materiel management personnel to CECOM and Fort Monmouth. The disposal of additional excess housing in the Howard Commons area of Fort Monmouth was also ordered.

In October 1996, the Commander of CECOM dedicated Building 1207, which became the new CECOM Headquarters, in memory of

Lieutenant General Alfred J. Mallette, who commanded CECOM from July 1990 to July 1992.

Courtesy of CTSC Visual Information Services.

CECOM Headquarters - Building 1207. Renamed Mallette Hall in memory of LTG Alfred J. Mallette in 1996.

CECOM spent a tremendous amount of effort during each round of BRAC in order to stay competitive and comply with the decisions reached by the commission. Task Forces were formed prior to each round as a way to better posture ourselves in the eyes of the decision-makers. Unlike many other installations, each of the last two BRAC rounds resulted in a gain for Fort Monmouth, which also meant additional work. Sixty million dollars in Military Construction money for renovations and new construction was awarded to accommodate the influx of employees to Fort Monmouth. Logistically, it was a challenge to physically relocate so many employees while avoiding any interruption to our mission.

Courtesy of Fort Monmouth Historical Museum.

Portrait Artist Nancy Gosnell of Fairhaven, NJ, with Mrs. Nancy Mallette and Major General Gerald P. Brohm at the dedication of Mallette Hall

Currently, there is a new BRAC initiative in Congress, and the announcement of next round of closures is expected in 2005. The Pentagon has already announced that it wants to close as many as 100 of its 398 installations.[80]

TEAM C4IEWS FORMS

Amidst the BRAC realignments directed by higher headquarters, CECOM began a strategic alignment of its own in 1993 when it formed TEAM C4IEWS, short for Command, Control, Communications, Computers, Intelligence, Electronic Warfare and Sensors. This partnership was comprised of several organizations: CECOM, PEO C3T (Command, Control and Communications-Tactical), PEO EIS

Courtesy of CTSC Visual Information Services.

Official logo of TEAM C4IEWS.

(Enterprise Information Systems), PEO IEWS (Intelligence, Electronic Warfare and Sensors), (ARL) Army Research Laboratory, and DISA (Defense Information Systems Agency, or DISA). Although the names of some of these organizations have changed through the years, their commitment to the partnership has not. The overarching goal of the partnership is best summed up by its mission statement, which reads: "We, the leaders of the above C4IEWS member organizations, commit to work together to support the vision of Fort Monmouth as a premier global Center of Excellence in developing and supporting superior C4IEWS systems and equipment as well as new architecture for strategic communications, automation and defense information infrastructure."

In essence, the signatory organizations were agreeing to look beyond organizational boundaries and work together to develop innovative integrated solutions for the warfighter. By formalizing their cooperation, the partnership has managed to overcome organizational differences and better support the soldier.

Two excellent examples of this alliance are the Digitization of the Heavy Forces at Fort Hood, TX, a PEO C3T-led project supported by the rest of the partnership, and the creation of the Stryker Brigade Combat Team (SBCT) at Fort Lewis. Because of its success, the Team C4IEWS Partnership Charter has been renewed several times since it was created, in 1998, 2001 and 2002, reaffirming commitment to the Team. During the ten years following the formation of the partnership, the missions of CECOM and other Team C4IEWS members would grow together.[81]

CECOM'S RESPONSIBILITY FOR IT AND SUPPORT BROADENS

As information age technology began to blur the distinction among tactical, strategic, and sustaining base capabilities, having a single, integrated engineering organization was considered critical for coherent progress leading to the force of the future. To address the requirement, a SOMA (Signal Organization and Mission Alignment) study was conducted in order to determine the most efficient way to organize the

Signal Corps' information management capabilities. As a result, all of the information management, acquisition, engineering and procurement operations of the former Army Information Systems Command (ISC) were assigned to CECOM. Through this reorganization, effective 1 October 1996, CECOM gained the Information Systems Engineering Command (USA ISEC) at Fort Huachuca, AZ, adding a total of nearly 1,600 civilian and 400 military personnel without relocation. Also as part of this reorganization, the Information Systems Management Agency (ISMA), already located at Fort Monmouth, was realigned in place, and began reporting to CECOM/AMC and not to ISC at Fort Huachuca. A year later, ISMA became part of the Systems Management Agency at Fort Monmouth, which would later be absorbed into PEO EIS.

In addition to these organizational changes directed by the Army, the Army Materiel Command directed CECOM to take operational control and management oversight of the Army Missile Command's Logistics Systems Support Center (LSSC), St. Louis, MO, and the Industrial Operation's Command's Industrial Logistics Systems Center (ILSC), located in Letterkenny Army Depot, PA and Rock Island, IL. CECOM's operational control of the LSSC and ILSC did not involve any personnel relocation. Furthermore, CECOM acquired Software Development Centers at Fort Lee, VA, Fort Meade, MD, and the Information Systems Software Center (ISSC) at Fort Belvoir, VA.

Beyond the increase in personnel, the significance of these realignments was a marked increase in our mission. Prior to 1997, CECOM was focused primarily on the operations, or tactical, domain of the spectrum and the technologies, software, sensors and products needed within the battlespace. In 1997, we gained responsibility for the infrastructure side of the spectrum and are now responsible for executing IT Infrastructure Improvements across all Army Posts, Camps and Stations. The realignments of 1997 gave CECOM responsibility for information technology across the full spectrum of operations, from the sustaining base to the battlespace.

Also in 1997, further reorganizations within the Army Materiel Command formally placed Tobyhanna Army Depot (TYAD) under the direct control of CECOM. Located in northeastern Pennsylvania, TYAD is the largest, full-service communications-electronics maintenance facility in the Department of Defense with more than 2,700 employees and 14 Forward Operating Locations located throughout the world.

Courtesy of Fort Monmouth Historical Museum.

Aerial view of Tobyhanna Army Depot.

As the DoD's recognized leader in electronics maintenance, systems integration, and downsizing of military communications and electronic systems, Tobyhanna is responsible for a wide array of products. The depot's primary specialties include engineering, maintenance and manufacturing services, systems integration, repair, overhaul, power projection and high tech training.

Over the years, TYAD has been on the winning side of many BRAC realignments and has acquired a variety of projects. In addition to its work supporting Army communications-electronics systems, TYAD performs depot-level maintenance on the guidance and control systems for the Maverick, Sparrow, and Sidewinder missiles used by the Navy and Air Force. The 1995 closure of Sacramento Air Logistics Center meant that all Air Force ground communications equipment is now being serviced by TYAD. In fact, by 2002, 40% of Tobyhanna's work supported the Air Force.

TASK FORCE XXI, ADVANCED WARFIGHTING EXPERIMENT

The culmination of battlefield digitization efforts within the US Army was the Task Force XXI Advanced Warfighting Experiment in which many of the systems conceived in the 1990's were extensively tested in a "real world" environment.

The brigade-sized task force consisted of two heavy battalions, one light infantry battalion, and a brigade support slice. Each of these exercises, held at the National Training Center in Ft. Irwin, were designed not only to assess the technical aspects of these digitization efforts, but also provide senior Army leaders with a sense of how these systems would perform in the hands of soldiers actively engaging in combat operations.

The lessons learned from this experiment went a long way in not only determining how useful and robust these new technologies were on the battlefield, but IT also validated the value of these systems in combat. While not every system involved met the goals of this exercise, the lessons learned from this experience were invaluable in helping Army engineers and scientists better refine and improve these systems.[83]

CIPO: A FOCUS ON INTEROPERABILITY

In 1998, the CINC (Commander in Chief) Interoperability Program Office (CIPO) was created in an effort to enhance interoperability among the Services.

The idea was that if old technologies were made more interoperable, and new technologies were "born joint", then the C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance) capabilities of the CINCs of the Nine Unified Commands would be greatly enhanced.

Throughout the DoD, there are three Commands that hold CIPO offices, one from each of the three services: CECOM represents the Army in this effort; SPAWAR (Space and Naval Warfare Systems Command, San Diego, CA) represents the Navy; Electronics Systems Center/Command, (Hanscom Air Force Base, MA) represents the Air Force.

Priorities for CIPO included increasing situational awareness to fight as a coalition force, and reducing fratricide. (Recently, the CINCs have undergone a name change, and are now referred to as Combatant Commanders).[84]

REVOLUTIONIZING MILITARY LOGISTICS

The CECOM Logistics and Readiness Center (LRC) is responsible for providing all the logistical support for virtually all electronics-related

items in the US Army inventory. However, in the late 90's, this organization, and every other tasked with a similar mission for other commodities, had to rely on a computer system that was over 30 years old. In response, the Army Materiel Command, in conjunction with CECOM and private industry, established the Wholesale Logistics Modernization Program (WLMP), which would later become simply known as LMP.

The goal of LMP is to modernize the Army's logistics system and use the same computer-based tools that private industry does in order to create a better supply system. Instead of running batches of requisitions, LMP will allow requests to be addressed in an almost real-time environment, dramatically improving the LRC's responsiveness to customer needs.

In addition, such a modern, enterprise-based program will allow logisticians to obtain additional information and insight far beyond what traditional printed reports could indicate. This means that different types of data can be better analyzed, resulting in better decisions on the part of the logistician. As a result, not only will it take less time for field units to order and receive the items they require, but CECOM will spend a lot less time and money providing this service to the Army.

While LMP represents a revolutionary improvement over the previous system, one of the most interesting aspects of this project was the innovative nature of the contract with CSC (Computer Sciences Corporation). AMC created a strategic alliance with private industry and purchased 10 years' worth of the service instead of buying the system outright. In addition, all of the existing data in the old system was successfully transferred into LMP and each Government employee whose job would be negatively affected was provided a "soft landing" that offered a $15,000 signing bonus and a three-year contract with CSC, among other benefits.

Another Army process-reengineering initiative, known as Single Stock Fund, targeted the way we purchase Secondary Items (replacement assemblies, repair parts and consumables). Before SSF, there was a distinct separation between the wholesale and retail level, along with a very complicated purchasing and procurement arrangement. With few exceptions, items that left the wholesale area would subsequently "disappear" into the retail system, and field units were given all the parts they wanted free of charge. This created little incentive to limit inventory, and an "iron mountain" of spare parts was stockpiled throughout the Army.

Under SSF, the distinctions between the wholesale and retail level logistics structures have been greatly diminished. AMC obtained visibility into the assets of the Directorate of Logistics at every post, camp and station, and paid for the repairs on every item. Not only did this simplify the management and funding processes, it also increased the visibility of assets since the wholesale level could now see what the retail level had in stock. As a result, logisticians could not just transfer items from the wholesale to the retail unit, but from unit to unit if necessary, creating additional flexibility and improving efficiency.

While specific parts of SSF are still being planned and implemented, the bottom line is that SSF now enables us to see more of our inventories, manage them more intelligently, and capture costs with greater clarity.[85]

STREAMLINING THE ACQUISITION PROCESS

CECOM and the Army recognized the need to speed the process by which we acquire and deliver the best technology available to our soldiers. Our efforts in acquisition reform have successfully allowed us to use commercially available products and software and adapt it where necessary to meet the needs of our soldiers. In instances where products and software are not available off-the-shelf, CECOM develops the new technologies needed to enhance overall capability.

The Interagency Interactive Business Opportunities Page (IBOP) was launched on May 14, 1999. Supporting all US Commands, the IBOP was seen by Army Leaders as an innovative and easy way to expedite the process of passing Solicitation and Contract information to and from potential bidders.

IBOP was a significant step towards implementing a totally paperless and more efficient environment. Designed to capture the entire solicitation process from posting draft documents to electronic signature of contracts, IBOP revolutionized the Acquisition business and continues to be utilized today as a main point of information dissemination regarding solicitations for DoD. Furthermore, IBOP has been successfully exported to other federal agencies and is currently used by Department of Energy, Department of State and all its Embassies world wide, Department of Commerce, U.S Special Operations Command, Army Forces Command, and U.S. Navy SPAWAR.

IBOP is one example of the CECOM Acquisition Center's efforts to

leverage technology growth and current commercial software applications to accomplish the rapid contracting solutions demanded today. Reverse auctioning is another, which compels sellers to bid down through vibrant competition with other sellers.[86]

COMMERCIAL ACTIVITIES (CA) STUDIES

The Commercial Activities study is a process that places government operations in direct competition with private industry to determine which provides the best service at the lowest cost with the winner being assigned to the task. The Army had an active CA program in the early 1980s, and garrison operations were the primary functions under review at many domestic installations. The last CA study done at Fort Monmouth was just this type and had been completed in 1982.

During the mid-nineties, the Army was once again utilizing CA studies as one of many tools available to achieve greater efficiency and effectiveness. CECOM announced three studies to Congress on 26 February 99: Information Mission Area (IMA) study at Fort Monmouth, the Fort Monmouth Garrison (FMG) Base Operations (BASOPS) Directorate of Logistics (cataloging) study, and the Tobyhanna BASOPS study of information technology and public works.

The final recommendations from these studies were made available in 2002, and the period of performance for all three areas was for one year, with four one-year options to follow. For both the TYAD and IMA studies, the in-house cost estimate prevailed, and the annual cost savings per year are estimated at $2.9 million and $8.9 million respectively. The Fort Monmouth Garrison Study resulted in a win for a contractor, which will result in an approximate annual savings of $1.4 million.[87]

BALKANS DIGITIZATION INITIATIVE

Developed in response to the capture of American soldiers in Macedonia, the Balkan Digitization Initiative (BDI) focused on installing a real-time vehicle tracking system designed to provide commanders with the precise location of any vehicle on patrol. The BDI, also known as "Blue Force Tracking," was a cooperative effort between U.S. Army Europe, the Program Executive Officer for Command, Control and Communications Systems (PEO C3S), the CECOM Logistics and Readiness Center, Tobyhanna Army Depot and TRW, Inc.

This program was considered critical to the entire effort in the Balkans since U.S. forces were continuously patrolling areas where there is serious potential for conflict. In order to provide adequate protection and ensure mission success, complete situational awareness was critical so that any problem encountered could be successfully dealt with. This system, along with all of the associated command and control mechanisms was designed, built, and installed in 70 M1114 up-armored Humvees in less than seven months.[88]

Y2K

Like many other technology-dependent organizations, Y2K compliance became a significant issue. For the Army Materiel Command in general, and CECOM in particular, it was the single largest IT project ever undertaken. During the four years of the project's lifecycle, an estimated $45 million was spent on project management costs alone.

CECOM's role in this project was threefold. Not only was it responsible for ensuring that CECOM-managed tactical systems were compliant, it also supported AMC Headquarters in its overall implementation efforts, CECOM was also assigned the role of ensuring the IT infrastructure at every AMC installation was Y2K compliant. Items such as telephone switches, traffic lights, and even refrigeration units had to be identified, inventoried and corrected before 31 December 31 1999. Following the completion of a comprehensive IT inventory, organizations had to decide whether or not to reengineer, retire, or replace every item that was not compliant. Only after all that had been accomplished could programmers and software engineers begin work on addressing the specific compliance issues in each piece of software.

During the Y2K project, over 1.3 million items were inventoried and assessed, with over 986,000 being corrected for potential problems.

As the Millennium quickly approached, compliance efforts dramatically intensified. Despite the numerous technical and managerial challenges associated with this project, there were no significant problems associated with Y2K, and at CECOM, the clocks switched over to the new millennium without incident.[89]

CECOM COMMANDERS DURING THE 1990's

CECOM's leadership throughout the 1990's began with Major General

Alfred J. Mallette, who assumed command of CECOM on 10 July 1990. General Mallette was subsequently promoted Lieutenant General and assigned as the Deputy Commanding General of NATO's Office of Communications and Information Systems on 22 July 1992. Due to General Mallette's years of dedicated service to CECOM and the United States Army, Building 1207, CECOM's Headquarters Building, was renamed Mallette Hall in 1996.

Brigadier General Otto J. Guenther succeeded General Mallette on 22 July 1992, and was promoted to Major General on 20 October 1992. He remained at this post until 10 January 1995.

Major General Gerald P. Brohm replaced General Guenther as the Commanding General of CECOM until 1 September 1998.

The last Commanding General of CECOM during the 1990s was Major General Robert L. Nabors, who assumed command from 1 September 1998 to 20 July 2001.

Courtesy of Fort Monmouth Historical Museum.

Major General Alfred J. Mallette, Commanding General, CECOM, Fort Monmouth from 7/90-7/92.

Courtesy of Fort Monmouth Historical Museum.

Major General Gerald P. Brohm, Commanding General, CECOM, Fort Monmouth from 10/95-9/98.

Courtesy of Fort Monmouth Historical Museum.

Major General Otto Guenther, Commanding General, CECOM, Fort Monmouth from 7/92-10/95.

Courtesy of Fort Monmouth Historical Museum.

Major General Robert L. Nabors Commanding General, CECOM, Fort Monmouth from 9/98-7/01

11
CECOM AND THE 21ST CENTURY

JOINT CONTINGENCY FORCE ADVANCED WARFIGHTING EXPERIMENT

Perhaps one of the more significant lessons learned from the Gulf War was the need for interoperability between all of the armed services as well as our foreign allies. The ever-increasing trend towards coalition warfare meant the US Army would have to fight alongside units not just from different branches of the military, but from different nations as well. In order to fight successfully in such an environment, many different types of communications systems must work in concert with one another, and CECOM has been instrumental in this effort.

In September of 2000, a Joint Contingency Force Advanced Warfighting Experiment (JCF AWE) was held at Fort Polk, LA in order to establish just how the digitization of light forces would increase lethality, survivability and operational tempo. These AWE initiatives played a vital role in Army transformation since they allowed leaders to better determine just how well these systems worked. Because many of the new systems relied extensively on advanced communications and electronic components, CECOM and Team C4IEWS were heavily involved in this endeavor.

One of the most interesting and significant systems developed by CECOM and tested during this exercise was the En-route Mission Planning and Rehearsal System (EMPRS). This new system, installed on a modified cargo aircraft, allows soldiers to maintain situational awareness while in the air. Based primarily on a suite of enhanced communications equipment and onboard computers, EMPRS allowed embarked soldiers to remain in constant contact with joint forces and provided a template for airborne soldiers not just to change any aspect of their upcoming operation but "rehearse it" and determine how likely these alterations affect the success of the mission. This capability was especially critical on the modern battlefield due to the constantly

Courtesy of Fort Monmouth Historical Museum.

Major General William H. Russ, Commanding General, CECOM, Fort Monmouth from 7/01-Present

changing nature of warfare, and EMPRS was praised as the "crown jewel" of the exercise.

On 20 July 01, Major General William H. Russ succeeded Major General Nabors as the Commanding General of CECOM, and remains in command at the time of publication.[90]

SEPTEMBER 11, 2001

Courtesy of CECOM Fort Monmouth.

Attack on New York City, September 11, 2001

On September 11, 2001, life at Fort Monmouth and life in America changed forever. At 0800, a group of volunteers were assembling at the Fort Monmouth Expo Theater to participate in a three-day force protection exercise involving law enforcement agencies and emergency personnel at all levels, from Fort Monmouth firefighters to the NJ State Police. The exercise was to simulate a biochemical terrorist attack at Fort Monmouth, and to study the emergency response that would take place after such an attack.

So, a little after 0900, when the director of the exercise informed the volunteers that a plane believed to have been hijacked by terrorists had just crashed into one of World Trade Center towers, the group pretended to be horrified and upset, never believing the story to be anything but part of the simulation. The real horror came a few moments later when the volunteers realized this was not part of the simulation. The three-day exercise that took months to plan was cancelled in a matter of minutes, and they were now being instructed to return to their offices and stay there.

Groups of employees assembled wherever they could find a TV or a radio. They listened in horror along with the rest of the world as the second plane hit, as the Pentagon was hit, as the Towers collapsed, and as a plane went down over western Pennsylvania. The first direct attack on American soil since Pearl Harbor had just occurred.

The Emergency Operations Center sprang into operation 24 hours a day,

seven days a week. In the days and weeks that followed, Fort Monmouth quickly realized we did not have enough manpower to monitor access to the base as required by the new threat level. Gates were closed and access was limited to only a few main roads. Volunteer employees gave their time, even on weekends and after duty hours, to help check identification cards at the gates. A Visitor Control Center was initiated to process visitors, and reserve soldiers were activated to augment our security on post. All of these initiatives remain in place to this day.

While Force Protection measures were being upgraded and put in place, CECOM was also called upon to help at the World Trade Center (WTC) site rescue effort. Our technologies helped rescue workers in a variety of ways. The world's smallest infrared camera, developed by CECOM and attached to PVC pipe, was used for finding and searching through voids in the rubble. A laser doppler vibrometer was also used to judge the structural integrity of the buildings and electronic listening devices were used to detect distress calls to 911 made from cellular phones. Additionally, hyperspectral flyovers were conducted to monitor and control recovery operations from the air.

Courtesy of CECOM Fort Monmouth.

CECOM deployed a quick reaction task force to the Pentagon to install a communications infrastructure for 4500 displaced workers. CECOM teamed with the Pentagon renovation office to provide engineering and integration support to renovate the Pentagon's command and control infrastructure in support of the Pentagon rebuild (Phoenix Project).[91]

This is not the first time CECOM has responded to national rescue efforts. When Hurricane Andrew hit Florida in 1992, CECOM personnel were deployed there for about one month in order to help set up a humanitarian depot that facilitated the distribution of rescue supplies and restore communications in the area. CECOM also assisted in the North Ridge Earthquake in Los Angeles in 1994.

HOMELAND SECURITY

As a result of the 9/11 attacks, our nation placed an unprecedented emphasis on Homeland Security (HLS). Because CECOM was there within days of the attack to provide support, we experienced first-hand the need for better communications, more integrated response plans and quicker response times. Given the nature of our mission and our close proximity to New York City, CECOM is in a unique position to help with future HLS efforts and has already begun by using some of our technologies to provide protection to area nuclear power plants. HLS was one of CECOM's top initiatives in the months after 9/11, and will continue to be in the future.

CECOM and Operation Noble Eagle

President George W. Bush announced the mobilization of reserves for homeland defense on September 15, 2001 in response to the terrorist attacks of September 11. The initial call up of reserve forces was for homeland defense only but was later expanded to include reserve forces for Operation Enduring Freedom. For Fort Monmouth, Operation Noble Eagle began in October 2001 with the arrival of Bravo Company, First Battalion, 181st Infantry Regiment from Boston. The company's mission was to protect the Fort Monmouth community, its facilities and personnel stationed here. Bravo Company performed ID checking at the gates 24 hours a day, 7 days a week, randomly searched vehicles, and conducted building and perimeter security. The 181st returned home in September 2002 and was replaced by Bravo Company, 104th Infantry Regiment, a National Guard Unit from Greenville, Massachusetts. The 50th Combat Support Battalion, Detachment One from West Orange New Jersey, replaced Bravo Company in June 2003. In addition to their regular duties, the Reserve forces became integrally involved with Fort Monmouth and the surrounding communities, paying visits to local veterans homes and schools and explaining what the military is like and what life is like as a soldier.[92]

CECOM and Operation Enduring Freedom

The first response of the U.S to the attacks of September 11 was to seize financial assets and disrupt the fundraising network of terrorist groups. Initial deployments then began to Southwest Asia and Afghanistan. On September 20 President Bush announced the start of the war on terror and demanded the Taliban in Afghanistan hand over all Al Qaida terror-

ists living in their country or share their fate.

Operation Enduring Freedom commenced on October 7, 2001. Air and land strikes were carried out by B-1, B-2 and B-52 bombers, F-14 and F/A 18 fighters and Tomahawk cruise missiles launched from U.S and British ships and submarines. Fort Monmouth's preparations for Operation Enduring Freedom began in the weeks following September 11 as all centers geared up and prepared to supply equipment and fulfill emergency requisitions. CECOM deployed a total of 875 military, civilians and contractors during OEF. Lithium batteries, Firefinder and night vision equipment were the highest demand items initially requisitioned. Batteries were again in short supply during Operation Enduring Freedom, particularly the BA 5590.

One of the important CECOM systems used in Afghanistan is the phraselator. Developed in conjunction with DARPA, this system translates the English voice into Dari, Pashto, Arabic and other languages using fixed phrases from force protection and medical domains. This system was critical in OEF as there were not enough trained linguists on the ground. CECOM is continuing to assist DARPA in providing new domain vocabularies and developing a two-way phraselator capability.

CECOM developed a prototype demo unit for "down well" viewing in Afghanistan. The system was an immense success with the troops and was first deployed to Afghanistan in March 2003. CECOM engineers were sent to Afghanistan in October 2002 to support the Combat Service Support Automated Information System Interface (CAISI), a set of deployable wireless LAN equipment. CECOM civilians supported this system in a brigade support area near Kandahar. Eventually, the success of the equipment and the increase in soldier morale led to it being installed in 15 more remote locations in Afghanistan.

CECOM sent a team to SWA to take charge of crisis action planning, resolve financial and appropriations issues, establish a contracting office in a high threat environment, and provide administration of war contingency contracts. This team was responsible for successfully equipping joint forces in the region, standing up the Afghan Army logistics system and institutions, and accelerating the local production of supplies to help increase self reliance and build the local economy.

In the early days of Operation Enduring Freedom, President Bush gave a speech (Oct. 11, 2001) claiming, "ultimately, one of the best weapons,

one of the truest weapons that we have against terrorism is to show the world the true strength of character and kindness of the American people." President Bush asked every child in America to send a dollar to the White House for the children of Afghanistan. Fort Monmouth children took to the President's task with gusto and spent a year raising money through all types of fundraising projects and sent over $1000 to the White House in October 2002.

One of CECOM's tenant activities, the 754th Explosives Ordnance Disposal Detachment was deployed to Afghanistan in support of Operation Enduring Freedom in November of 2002 and returned June 2003. Their mission in Afghanistan was to dispose, render safe and give advice about explosive hazards and ordnance. Based out of Kandahar, the 754th supported everyone in Afghanistan, to include units in Uzbekistan. Their main customers were Special Forces groups, the Air Force and teams from the 82nd Airborne Division. During their deployment they disposed of 652,000 pounds of explosive ordnance and were called out to 26 incidents. One of their most harrowing experiences occurred in a town called Meymaneh. They were called in to do a cache disposal at a cave complex, numbering 19 caves. Eighteen of these caves were filled with ordnance and 337 pounds of explosives. They did not have enough C4 explosive to dispose of everything, so they instead decided to collapse the caves. During the disposal process there was an unscheduled detonation in cave three and one soldier and one interpreter were injured requiring evacuation. Some of the excess ordnance and ammunition was sent to the Kabul training school to help train the Afghan army. The 754th was well known in Afghanistan for being able to adapt quickly to emergency situations with creativity and limited resources. One such occasion involved a car accident near Kandahar where soldiers from the 754th used their portable X-ray machines to assist local nationals that had been hurt.

Problems and lessons learned during OEF were similar to those to be encountered in Kuwait and Iraq. There were issues with bill of materials arriving in the country on time. Some of these problems were due to extreme weather conditions. Preparations for deployment were often arduous tasks as engineers and administrative personnel were responsible for completing all documentation and orders for not only government personnel but also all the contractors sent to Afghanistan. Depending on Military transport to get to Kandahar airport was often a problem and caused lengthy delays. It often took personnel well over a week to get to the theater. There were also problems protecting CECOM equipment

from excessive heat. This problem was solved by using Hex solar shades and Modular Ammunition solar shades (MASS). However, this equipment could only be requested through SBCCOM, approved by HQDA and demand far exceeded supply.[93]

2002

In 2002, CECOM again found itself in the midst of another Army reorganization effort. Seeking to manage resources more efficiently and consolidate duplicated efforts to provide a stronger defense in a new era, CECOM was feeling the effects of those adjustments.

TIM, or the Transformation of Installation Management, looked at the way the Army managed its posts, camps and stations, and sought to centralize management. For CECOM, this meant that our Garrison Commander would report to a regional office rather than to the Commanding General of CECOM. It was the Army's belief that centralizing installation management into regions would provide for more streamlined funding, a tighter focus on similar installation issues within a defined geographic region, and enable establishment of better standards for installations. DA also intends to improve support to the Army Transformation and the readiness of our soldiers through TIM.

The U.S. Army Installation Management Agency (USAIMA) will direct overall Army installation operations. Regional offices will manage all Army installations and garrisons within a geographical area. There will be seven regional offices under TIM and Fort Monmouth's Garrison will belong to the Northeast Regional Office at Fort Monroe, Virginia. The new installation management and realignment was implemented on 1 October 2002, although employees will not be formally realigned until October of 2003.

NETCOM (Network Enterprise Technology Command), established in October of 2002, is another current Army-wide realignment effort that will affect CECOM. In the same way TIM is centralizing our Garrison Management, NETCOM is centralizing the management of the Army's information technology and networks. NETCOM will be aligned in several geographic regions, each with a Regional Chief Information Officer (RCIO). CECOM will receive its support from the Northeast Region, located at Fort Monroe, VA.v4

KNOWLEDGE MANAGEMENT

By 2002, CECOM was truly a global organization, with only 47% of employees residing at Fort Monmouth. In response to this, the CECOM Knowledge Center was unveiled in May 2002. The "KC" is an internal knowledge-sharing portal intended to connect together the now global CECOM.

The Knowledge Center allows information papers, trip papers, policies, and other documents to be stored in a document library that can be easily searched by other Knowledge Center users. It also offers collaborative workspaces and virtual meeting tools to facilitate project management. With more than half of the workforce eligible to retire in five to ten years, knowledge management initiatives that target the preservation of expert knowledge before it walks out the door are being put in place at both CECOM and at the Army level.[95]

ENTERPRISE SYSTEMS ENGINEERING

Another initiative pursued in 2002, Enterprise Systems Engineering (ESE), quickly turned into a concept and eventually became one of CECOM's top priorities. Simply stated, the concepts behind ESE is a single systems engineering effort that ties all discrete integration initiatives together into an enterprise architecture solution. CECOM has perceived this need and set up a Systems Engineering Team that compiled a "systems engineering handbook" and prototyped a system to address questions that have enterprise implications.[96]

C4ISR ON-THE-MOVE

Another initiative pursued in 2002 was the C4ISR On-the-Move Demonstration. Pivotal to the success of Army Transformation will be the ability for an integrated command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) system–of–systems to increase the lethality and survivability of the lighter platforms of the Future Combat System (FCS).

The Army is approaching Milestone B, which impacts the decision on whether or not to continue the development of the FCS. This Chief Of Staff decision will be partially based on the C4ISR On-The-Move demonstration that will illustrate how C4ISR technologies can effectively obviate the need for heavy armor to protect the future force, and

add to the lethality of the force.

The two-week demonstration took place at Fort Dix, NJ, conveniently located 40 miles from Fort Monmouth, providing ample space to showcase the system's capabilities. A number of VIPs attended the demonstrations, and the exercises were considered an overall success by those who participated and observed.[97]

CECOM and Operation Iraqi Freedom

Operations in Iraq began on March 19, 2003 with joint strikes by the U.S and Great Britain, designed to disarm Iraq of its weapons of mass destruction and remove the regime from power. CECOM had been preparing for strikes against Iraq in early October by forming an Anticipatory Logistics Cell (ALC) to identify potential spare and repair part shortfalls. The ALC developed a list of CECOM systems expected to be deployed by the Army, Special Operations and Marines. Supply supportability assessments were conducted, enabling CECOM to identify potential spare and repair part shortfalls. During the war the ALC investigated high priority spare requests from Iraq and took action with logistics weapon system managers to accelerate deliveries.

During OIF, CECOM & TEAM C4IEWS acquired, developed, fielded, and supported an array of technological systems including frequency hopping tactical radios, satellite linked computers inside vehicles, sophisticated sensors, and electronic jamming systems. CECOM deployed more than 391 military, civilians and contractors during OIF. CECOM also deployed 152 Logistics Assistance Representatives (LARs). Thirty-two LARs were embedded with the 3ID, 101st and 82nd Airborne during combat operations. LARs provided technical and logistical assistance for CECOM Systems. During operations in Iraq, one CECOM LAR was wounded in an ambush and was medevac'd to Germany.

CECOM Deployed two Electronic Sustainment Support Centers (ESSC) to Kuwait. The two ESSCs were made up of 65 logistics and maintenance personnel. Both centers were operational 1 March 2003 at Camp Arifjan, Kuwait. ESSCs provide a robust embedded and regional logistics and maintenance support capability for TEAM C4IEWS systems. CECOM also established a forward repair activity in Qatar. The forward repair activity was designed to cut in half the turn around time for the repair of STAMIS/TIER III used in SWA. The activity moved to Kuwait prior to

the start of OIF.

Fort Monmouth operated an Emergency Operations Center 24 hours a day, 7 days a week. The EOC continues to operate on three shift rotations and provides the CG with daily briefings. CECOM expedited over 131,984 OEF/OIF requisitions, of which 3,585 were major items. Of the 85,431 requisitions, 45 000 were high priority items for which extraordinary measures were taken to ship and track the items. CECOM accelerated the production and delivery of critical weapon systems and met surging demands for items such as lithium batteries, night vision, mobile subscriber equipment, tactical satellite, SINCGARS, Aviation and communication security. CECOM responded to 4,713 materiel release orders. These materiel release orders were mostly emergency call-ins to support Joint Chiefs of Staff special projects.

CECOM expedited contract awards and modifications to satisfy urgent war needs. Twenty seven awards were made totaling over $63 million, including urgent requirements for FBCB2, lithium batteries, antennas, transceivers, secure enroute communications packages, near term digital radios, laser detecting set, shortstop electronic protection systems, single channel ground and airborne radio system, joint tactical terminals, and Coalition joint forces land component command rotational units.

Casualty assistance services were provided for service members' families from northern and central New Jersey. These services were provided for families of soldiers who were either killed in action or in non-combat accidents while deployed.

CECOM CSLA Cryptographic Key Materiel Inventory Managers responded to over 100 flash and immediate priority messages concerning compromise, emergency replacement and additional requirement for cryptographic key material. They also assisted NETCOM and our local DOIM in transmitting message traffic to the theater and expediting the shipment of Iridium secure telephones to units in Iraq.

CECOM teamed with NETCOM to upgrade the Central Command (CENTCOM) command center in Qatar and to make the infrastructure operational. The CENTCOM Command center was routinely seen on CNN and other news networks. CECOM developed, acquired and performed quality control for this center.

An Initial Operational Capability (IOC) enterprise management infra-

structure was designed and installed by CECOM. The IOC was installed in October 2002 to support the SWA theater at Camp Doha, Kuwait. This system managed the signal and data networks in the theater. CECOM also installed and tested the Al Udeid Air Base Earth Terminal Complex. The earth terminal complex provided a new dynamic intra-theater STEP capability during OIF.

Twelve new software releases were made by CECOM throughout operations in SWA. CECOM made software changes to a variety of systems to include COMSEC equipment, ASAS, Guardrail, and the artillery fire control codes. CECOM also developed six mission data sets for the radar signal detection set. One was requested by the Air Force for use on their search and rescue platform. CECOM also supported Secretary of State Colin Powell for his address to the UN on 5 February, 2003. CECOM replicated 1000 copies of a CD for his multi media presentation to the UN Security Council entitled "IRAQ-Failing to Disarm."

Through the use of Blue Force Tracking and the Force 21 Battle Command Brigade and Below Command Control System (FBCB2), friendly fire incidents were virtually eliminated in OIF. Developed, fielded and supported by Team C4IEWS, these systems gave commanders an unprecedented ability to see what was happening on the battlefield and to synchronize their forces. The combat and thermal identification panels, Phoenix Infrared lights and GLO tape infrared reflective material also reduced incidents of fratricide during OIF and were deployed by Team C4IEWS.

The Firefinder radar system was instrumental in OIF. Firefinder detects and locates enemy mortar and artillery weapon firing positions. In many instances, the Iraqis were forced to hold their mortar and artillery fire in self-defense rather than fire on allied troop positions. Firefinder was developed, fielded and supported by Team C4IEWS

U.S Aviators, helicopters and aircraft were safer during OIF than ever before due to a Team C4IEWS piece of equipment, the AN/ALQ-144 Infrared Jammer. These jammers were mounted on the fuselage of helicopters and emitted signals to decoy heat-seeking missiles and caused them to detonate in the air and miss their targets.

CECOM developed and implemented an automated accountability system, Roll Call, for deployed personnel. Roll call was implemented

throughout the command to track and record command deployments and ensure total command personnel accountability on a daily basis. The CECOM EOC responded to 125 actions from AMC about deployed personnel.

Lessons learned from OIF have included such issues as beginning an army wide training program to show the benefits of rechargeable batteries. The shortage of lithium batteries during OIF would have been a great problem had the war gone on for much longer than it did. Problems were also noted with several CECOM and Team C4IEWS systems due to environment, equipment age and lack of trained personnel. Solutions to these problems included having PM representatives deployed in theater to support systems, fully inspecting equipment before shipping, strictly following technical manual guidelines in sand environments, and keeping parts and risk kits in theater. There was a shortage of repair parts during OIF due to problems with transportation. Items took a long time to get to the CONUS departure sites and they arrived palletized at the theater distribution center, which again increased the amount of time it took to get the part to the recipient. LARs reported significant shortages of communication and transportation equipment. In the future, a communication and transportation package is recommended for LARs as part of an initial deployment package.[98]

TENANT ACTIVITIES

UNITED STATES MILITARY ACADEMY PREPARATORY SCHOOL (USMAPS)

Courtesy of Visual Information Services.

USMAPS, established in 1945, moved to Fort Monmouth from Fort Belvoir, Virginia on 1 August 1975.[99]

The school's purpose is to prepare and train selected enlisted members of the Army to qualify for admission to the United States Military Academy, and to provide training, which will assist them after they arrive at West Point. The school is open to enlisted members serving on active duty in the Army; to enlisted members of the Army Reserve and National Guard; and to civilians who are authorized by the Department of the Army to enlist in the Army Reserve for the purpose of attending the preparatory school.

About 320 soldiers enter USMAPS each year to compete for 170 appointments to West Point.

Courtesy of Visual Information Services.

The US Military Academy Preparatory School located on Fort Monmouth.

FEDERAL BUREAU OF INVESTIGATION (FBI)

The agency's Northeast Regional Computer Support Center here serves the FBI's largest field office--Now York City--plus field offices in Albany, Boston, Newark, New Haven, Philadelphia and Richmond.

The activity began with 25 personnel, mainly computer operators, and now currently has approximately 115 employees.

754TH ORDNANCE DETACHMENT

754th Ordnance Detachment's mission is to train police, fire and public officials in explosive ordnance disposal and bomb threat search techniques, as well as to reduce the hazard of domestic or foreign conventional nuclear, chemical, biological and improvised explosive ordnance that personnel or outside activities may encounter. This unit has a current strength of 19 military personnel.

PEO IEW&S

The Program Executive Office Intelligence, Electronic Warfare and Sensors (PEO IEW&S) mission is to field and insert state-of-the-art, interoperable sensor capabilities and products which enable the land component commander to control time, space and the environment, while enhancing survivability and lethality, through continuous technology evolution and warfighter focus in the right place, the right time, and at the best value for the U.S. taxpayer.

PEO C3T

The product and project managers and directors of Program Executive Office Command, Control and Communications Tactical (PEO C3T)

provide a wide and integrated array of systems products and capabilities designed to meet the needs of today's Warfighter, while continuing to evolve to meet tomorrow's requirements. They encompass everything from tactical satellite communications and intelligence gathering systems to devices used by the combat soldier in the field. The Mission of PEO C3T is to rapidly develop, field, and support leading edge, survivable, secure and interoperable tactical, theater and strategic command and control and communications systems through an iterative, spiral development process that results in the right systems, at the right time and at the best value to the warfighter.

PEO EIS

The Program Executive Office Enterprise Information Systems (PEO EIS) reports to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology. They are responsible for developing, acquiring and deploying tactical and non-tactical Information Technology systems and communications, with the goal of assuring victory through information dominance. PEO EIS provides DoD and the Army with network-centric knowledge-based business and combat service support systems and technology solutions. They provide the infrastructure and information management systems that support every soldier, every day. PEO EIS assists with the accession and training of soldiers, tracks the Army's personnel and medical information, provides and maintains warfighters' equipment, and plans the movement of their supplies and assets. Their vision is to become an enterprise-wide Center of Excellence for System Acquisition, Development, and Integration products and services.

MILITARY INTELLIGENCE DETACHMENT, ALPHA CO. 308TH M.I.B.N, 902D M.I GROUP

The 308th Military Intelligence Battalion conducts counterintelligence operations throughout CONUS to detect, identify, neutralize, and defeat foreign intelligence services (FIS) and international (IT) threats to U.S Army and selected Department of Defense forces, technologies, information and infrastructure. On order, reinforces designated unit(s) with CI and support personnel.

PATTERSON ARMY HEALTH CLINIC

The mission of Patterson Army Health Clinic is to provide and coor-

dinate high quality care for all of our beneficiaries in the highest tradition of military medicine, while promoting optimal health and maintaining readiness.

13
LOOKING AHEAD: 2004 AND BEYOND

As we look to the future, CECOM plays a important role within DoD. We are responsible for 50% of the Army's Advanced Technology Demonstrations, and have the largest Communications-Electronics Depot in DoD. We manage the majority of the Army's software and are key players in Homeland Security. CECOM is critical to the success of the Army Transformation.

If the 1980s were focused on modernization, and the 1990s were focused on digitization, then the next decade will surely focus on transformation. As we look ahead to 2004 and beyond, we can expect to see increased sophistication in information technology, and accordingly, our military leaders will grow more and more reliant on C4IEWS technologies.

Concepts, such as Network Centric Warfare, indicate the future of combat is one that will be radically different from any that have come before. In this new way of looking at battle, the idea will not be to use massive and overwhelming firepower, but rather superior information to quickly defeat an opposing force. Unlike other revolutions in military technology, the centerpiece of this concept is not a new kind of weapon, but rather a seamless integration of every existing weapon in the battlespace. To make this concept a reality will take not just a great deal of technological innovation, but also technological integration.

As it has in the past, CECOM and Team C4IEWS are working to provide vital information dominance capabilities that will give the warfighter a decisive advantage on the battlefields of both today and tomorrow.[100]

Courtesy of Visual Information Services.

END NOTES

1. H. E. Winter, "History of Fort Monmouth," Signal Corps bulletin 35 (Aug 1926); "Post Return" reports sent by the CO of the camp to the Attorney General of the Army each month commencing June 1917.
2. Authority of the Army Purchase Act, 25 February 1920.
3. On 6 April 1917, the War Department field administration was decentralized to four territorial departments in the U.S., one in Hawaii and one in the Philippines. Territorial departments were organized to assist the War Department. They were in essence miniature war departments within their respective territorial spheres. The Eastern Deparment comprised roughly the mid-Atlantic states with headquarters at Governors Island, N.Y. MG Leonard Wood was Commanding General of Eastern District at this time.
4. Order 122, Office of the Chief Signal Officer, 21 August 1917. Born at Morristown NJ, in 1807, Alfred E. Vail graduated from the University of the City of New York in 1836 and early became asso ciated with Samuel F. B. Morse. Vail's mechanical knowledge greatly expedited the first experiments in telegraphy. He devised the Morse alphabet of dots, dashes, and spaces. His automatic roller and grooved lever embossed on paper the characters that were transmitted. Vail was the superintendent of construction of the original telegraphy line between Washington and Baltimore. Inventor of the finger key, he received the first message successfully transmitted in 1844. In view of the great contributions made by Vail to wire communications, it was proper that his name be com memorated in a Signal Corps training camp.
5. S.0. 139, War Department, 14 June 1918.
6. Lt. Lawrence Galton and Lt. Harold J. Wheelock, A History of Fort Monmouth, New Jersey (Fort Monmouth, 1946).
7. Helen C. Phillips, United States Army Signal School 1919-1967, (Fort Monmouth : USA Signal Center and School, 1967).
8. Signal Corps Bulletin, August 1926, 15.
9. Phillips, 22.
10. Galton and Wheelock, The History of Fort Monmouth. 1917-1953, (Fort Monmouth: Historical Branch G3, 1953).
11. OC SIG O Letter to CO, FM, 12 August 1929.
12. History Report of SC Engineer Labs, July 1930-December 1943.
13. Galton and Wheelock, 30-31.

14. PL 177, 69th Congress (Appropriations for Construction at Military Posts and for other Purposes).
15. PL 518, 70th Congress, 26 May 1928.
16. Complete descriptions of units and equipment tests made during Army maneuvers in the 1930's are covered in the Signal Corps Bulletins numbers 53 (March-April 1930); 75 (November-December 1933); 95 (March-April 1937); 100 (April-June 1938); 108 (April-June 1940).
17. Phillips, 54.
18. COL William R. Blair entered the US Army in 1917. He had many tours of duty at Fort Monmouth and became Director of the Signal Corps Laboratories in 1930. He is considered the Father of American Radar. Blair finally received a patent for the pulse echo technique in 1957. COL Blair retired in 1938 and died in 1962 at the age of 87.
19. H. M. Davis, History of SC Dir of US Army Radar Equipment. The field manual was WD, FM 11-25, GPO Wash: 1942.
20. Davis, Abstract.
21. PL 806, 70th Cong 25 February 1929 and the Army Appropriation Act, PL 278, 71st Cong. (28 May 1930).
22. PL 535, 71st Cong. (3 July 1930) and PL 718, 71 Cong (23 February 1931).
23. TAGO Ltr, (29 September 1932).
24. GO 221, (21 December 1953). HQ SC Center & FM.
25. PL 302, 72nd Cong (Title III of the Emergency Relief & Construction Act of 1932, approved 21 July 1934.
26. PL 67, 73rd Cong 16 Jun 1933 authorized all of the remaining per manent construction to 1936.
27. National Defense Budget Estimates for FY 1984, Ofc Of Asst Sec Def (Comptroller) March 1983.
28. BG D. Olmstead served as the tenth Commanding Officer of Fort Monmouth until July 1941. He was subsequently promoted to Major General and became the Chief Signal Officer of the Army from October 1941 to June 1943.
29. GO 11, HQ Fort Monmouth.
30. Camp Charles Wood is bound on the north by Tinton Avenue, on the east by Maxwell Place, on the south by Pine Brook Road, and on the west by Pearl Harbor Road.
31. GO 28, (3 July 1942), HQ Fort Monmouth, and War Dept GO 58, (29 October 1942). Camp Charles Wood was named in honor of LTC Charles W. Wood, SC, and redesignated the Charles Wood Area in 1958. LTC Charles Wood was assistant executive officer of

Fort Monmouth. He died suddenly on 1 Jun 1942 while on tem porary duty in Washington. Wood had retired from the Army in 1937 because of illness. He was recalled to service in Oct 1940, and served as post signal property officer at Fort Monmouth and later as assistant executive officer.

32. Galton & Wheelock, 84.
33. WD SO 274, 9 October 1942.
34. SCL 394, 30 September 1941.
35. Field Lab No. 1, was dedicated as Camp Coles, 1 October 1942, in honor of COL Ray Howard Coles, Assistant to and Executive Officer for the C Sig O, AEF, World War I. By WD, GO 24, 6 Apr 1945, Camp Coles was redesignated Coles Signal Lab. It was rededicated Coles Area 18 December 1956, when the USA Signal Equipment Support Agency occupied the site.
36. William R. Stevenson, Miniaturization and Micro Miniaturization of Army Communications- Electronics 1946-1964 (Fort Monmouth: Headquarters and US Army Electronics Command, 1966). Historical monograph 1, project Number AMC 21M; Max Marshall LTC, The Story of the Us Army Signal Corps, (New York: Franklin Watts Inc., 1965).
37. Ibid.
38. Ibid.
39. Stevenson; Marshall.
40. The total cost of property only making up the Charles Wood Area was $143,200. The property consisted of 475.68 acres. The tracks of land making up the acreage were known as the Eatontown Area; Wire School Area; Phillips Farm; Monmouth County Country Club; and Field Lab No. 2 of the SCGDL, were combined and officially designated HQ Camp Charles Wood.
41. History Report Of SCEL, July 1930 to December 1943, 6.
42. Kenneth J. Clifford, Commanding Officers of Fort Monmouth, (Fort Monmouth: Command Historian's Office, 1984).
43. David G. Buchanan and John P. Johnson, Historic Properties Report (Draft) (Building Technology and National Park Service, U.S. Department of Interior, July 1983).
44. Phillips, 204.
45. GO 35, DA, 3 August 1949.
46. GO 67, HQ Fort Monmouth, NJ (22 August 1949), the last order of that Headquarters.
47. Phillips, 219.
48. Ibid., 220.
49. Ibid., 241.

50. For a more detailed account of this event, see Rebecca Raines, "The Cold War Comes to Fort Monmouth, Senator Joseph R. McCarthy and the Search for Spies in the Signal Corps," Army History, no. 44. (Spring 1998), pp. 8-16. Following the arrest of the Rosenbergs in 1950, two former Fort Monmouth scientists, Joel Barr and Alfred Sarant, defected to the Soviet Union – a fact, unknown to McCarthy, that lends credence nevertheless to his suspicions.
51. Buildings 1204, 1205, 1212, now occupied by USMAPS since August 1975.
52. Myer Hall named in honor of the founder of the Signal Corps, Chief Signal Officer, 1860-1863, 1866-1880; Myer Hall dedicated 11 September 1953.
53. The auditorium and Myer Hall, occupied by USA Chaplain School June 1980 and USA Chaplain Board, September 1979.
54. Patterson Army Hospital officially opened 17 March 1958 and was dedicated 17 April 1958 in honor of MG Robert Urie Patterson, Surgeon General of the Army 1931-1935.
55. Buchanan and Johnson, 72, 81, 84.
56. Marshall; Stevenson; Amory H. Waite Jr., Radio Ice Depth Measurements, Papers and History Relating Thereto, (unpublished original manuscript and collection of documents). CECOM Historical Office.
57. DA GO 47, 24 June 1954.
58. GO 3, HQ USASRDL, 5 February 1959.
59. GO30, HQ USASRDL, 31 December 1958.
60. Marshall; Leonard D. Berringer, "Atomic Time standards," Instruments and Control Systems 39 (June 1966), 99.
61. Martin Blumenson, Reorganization of the Army 1962, (OCMH Monograph 37M, July 1965).
62. OC SIG O to CG Fort Monmouth 9 July 1962. ECOM actually activated by OC Sig O, 23 May 1961. ECOM officially organized 1 August 1962. HQ AMC G05, 26 July 1962.
63. HQ ECOM GO46, 26 June 1964.
64. HQ ECOM GO54, 26 June 1964.
65. HQ ECOM GO3, 4 January 1965.
66. HQ ECOM GO12, 25 Feb 1965.
67. ECOM. GO28, 27 May 1965; ECOM GO39, 27 May 1965; ECOM GO40, 27 May 1965.
68. HQ ECOM GO29, 27 May 1965.
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Courier, Final Report 1961, (Fort Monmouth: US Army Signal Re-search and Development Laboratory, 24 July 1961). Uncirculated Manuscript, Archives CECOM His-torical Office; DARCOM Installation and Activity Brochure, (Fort Monmouth, 1 March 1977); Annual Historical Summary of United States Army Electronics Command, 1 July 1970 - 30 June 1971, (ECOM: Office of the Historian, 22 February 1977).

70. MO Pers Auth of Strength Rpt, Form 108-1, Force Dev.
71. The Daily Register Newspaper of Shrewsbury, 18 June 1976.
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73. Monmouth Message, 26 October 1984.
74. CECOM News Release #064-84, 13 September 1984.
75. Monmouth Message, 27 July 1984.
76. Monmouth Message, 12 October 1984.
77. Monmouth Message, 1 October 1984.
78. Richard Bingham, CECOM and the War for Kuwait August 1990-March 1991. Army Historical Program Monograph AMC 167 (May 1994).
79. Deputy Chief of Staff for Plans and Operations (DCSOPS) Business Integration Division (BID), CECOM history research conducted by BID staff (2003).
80. Ibid.
81. Ibid.
82. Ibid.
83. Ibid.
84. Ibid.
85. Ibid.
86. Ibid.
87. Ibid.
88. Ibid.
89. Ibid.
90. Ibid.
91. Information Systems Engineering Command, OEF/OIF history report, 1 June 2003.
92. Monmouth Message, October 2001-August 2003.
93. CECOM OEF/OIF history and lessons learned reports (2003).
94. DCSOPS BID, CECOM history research conducted by BID staff (2003).
95. Ibid.

96. Ibid.
97. Ibid.
98. CECOM OEF/OIF history and lessons learned reports (2003).
99. Msg, HQ DA to Cdr TRADOC and Cdr DARCOM, R061221Z May 1975, Subj: Relocation of USMAPS
100. DCSOPS BID, CECOM history research conducted by BID staff (2003).